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THE FAMILY PHYSICIAN



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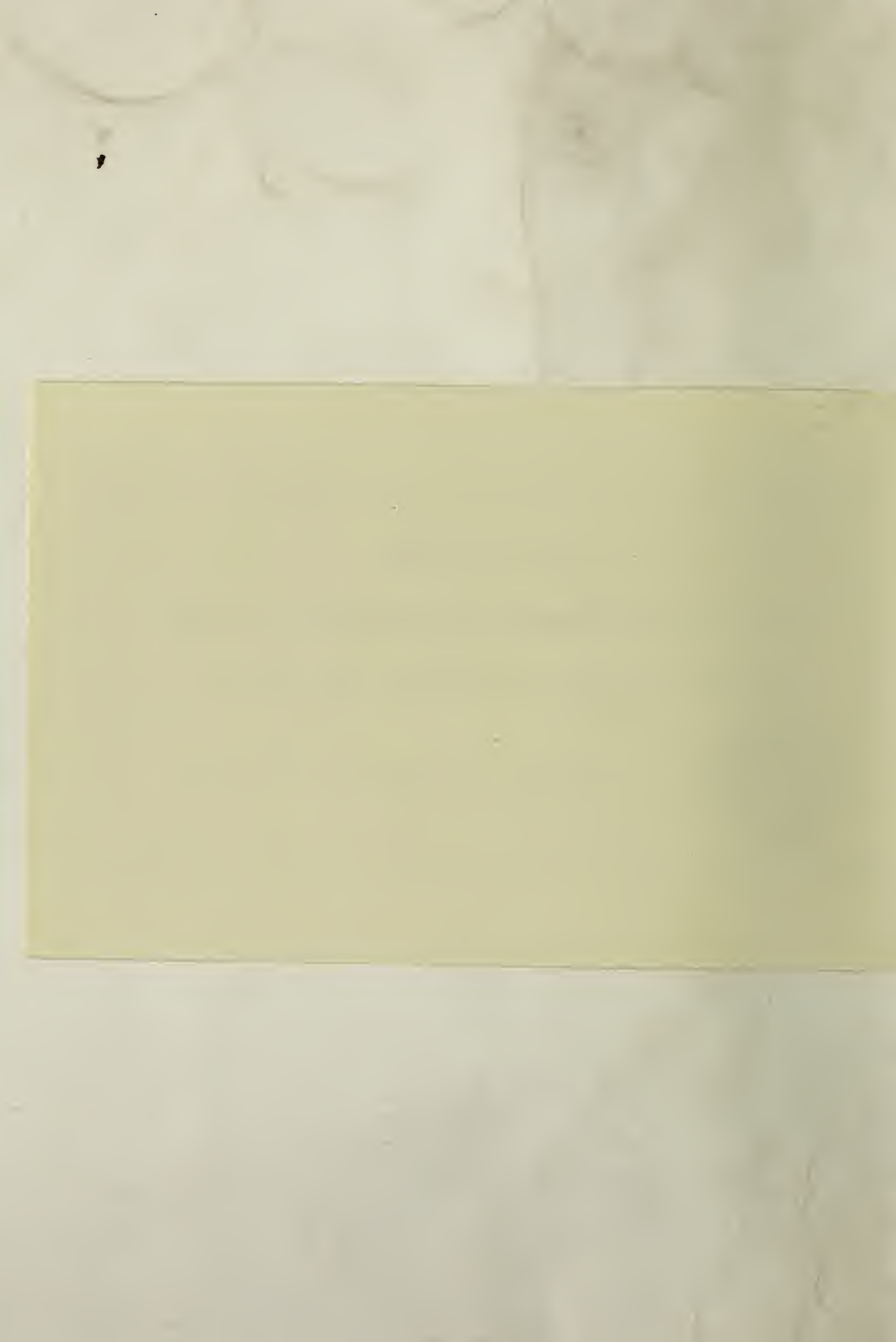
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SIR WILLIAM SAVORY, BART., F.R.C.S.

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THE
FAMILY PHYSICIAN

A Manual of Domestic Medicine

NEW AND ENLARGED EDITION

VOL V

CASSELL AND COMPANY, LIMITED

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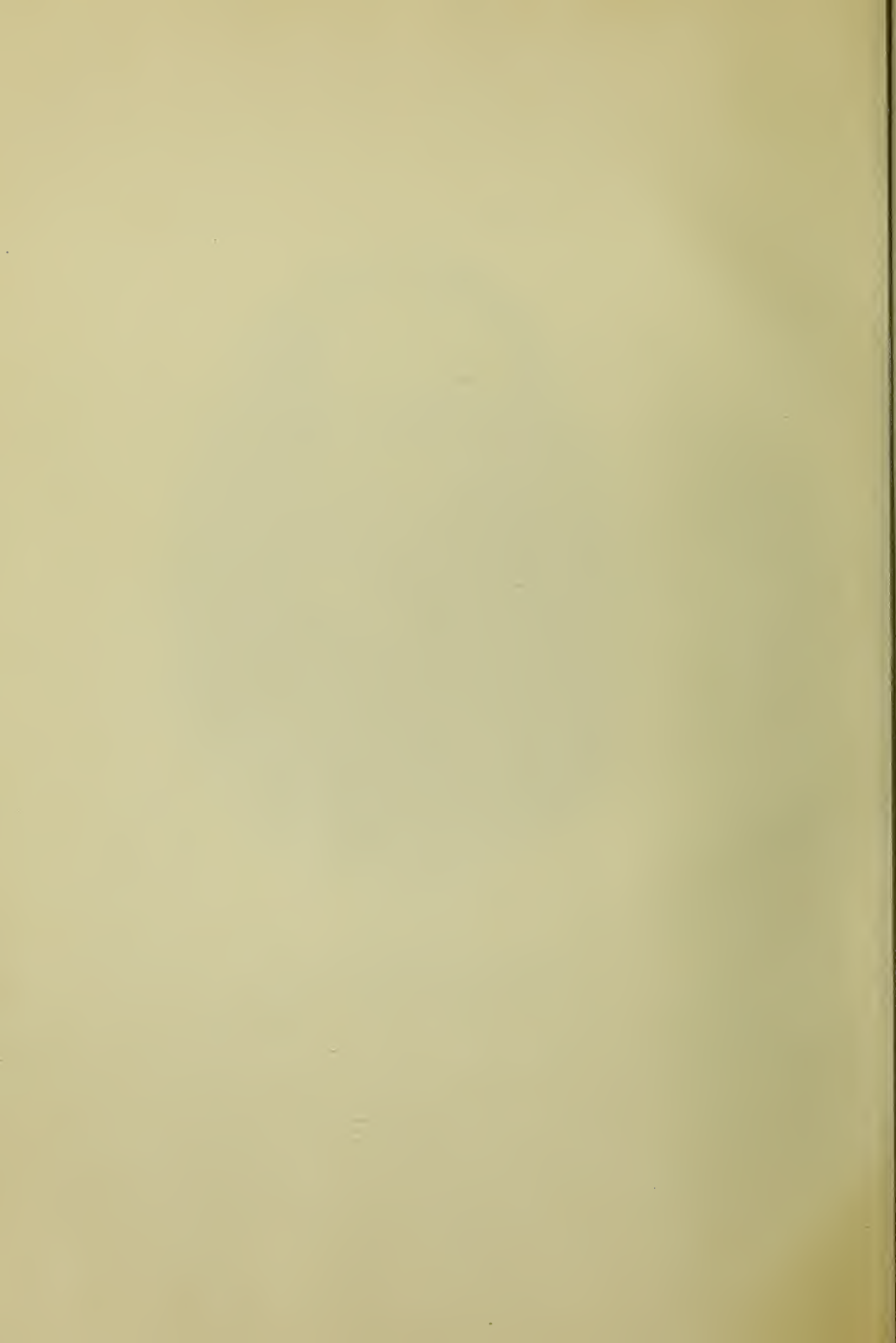
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FIRST AID TO THE INJURED.

PUBLISHERS' NOTE.

ALTHOUGH the subject of First Aid to the Injured has already to some extent been touched upon in Vol. IV. under the headings of "Domestic Surgery" and "Ambulance Work," the matter is one of such importance that the Publishers have deemed it desirable to devote the larger portion of this concluding volume of THE FAMILY PHYSICIAN to further and more thorough consideration of the subject. With this object the chapters which follow have been specially written by a specialist whose connection with Ambulance Work in this country entitles him to speak with authority on the subject.

The views set forth are the result of personal experience in the rendering of "First Aid," coupled with a long acquaintance with the systems of teaching employed by the leading Ambulance Associations of the world.

The series of photographs specially taken to illustrate the author's text, will, it is hoped, prove of good service in helping to the better understanding of the principles of "First Aid" that may safely be adopted in the absence, or prior to the arrival, of a doctor.

FIRST AID TO THE INJURED.

INTRODUCTION.

IT is almost certain that one and all of those who read these pages will become, sooner or later, eye-witnesses of accidents of some form or other. Whether these occur indoors or out of doors; whether in the home, the hunting-field, public thoroughfare, on lake or river, in the nursery or at the work-bench—time and place are not then the first consideration, but the prime point becomes, “How can first assistance be most speedily obtained?” At such a crisis the impulse and wish that will be uppermost must ever be directed towards the alleviation of the fellow-creature’s suffering. Then is the time, above all others, however, when, in far too many of the cases which arise, the almost despairing regret is, “Alas! how I wish I possessed a knowledge of the best means for alleviating the pain, and rendering some real assistance to this poor sufferer!”

The object of these pages on Ambulance Work is to remedy this condition of things, and to place everybody and anybody in a position, as every intelligent being should be, to render assistance—not merely of a sentimental, generous kind, but real, technical, legitimate help that must always be of inestimable value, pending the summoning and arrival of a properly qualified medical man. Let it be understood at the outset, however, that “First Aid to the Injured” does not mean discarding the qualified physician and surgeon. “First Aid” is essentially that assistance which may be safely rendered pending the earliest possible arrival of the doctor.

As the processes of labour and existence become more and more widespread and complex, the possibilities of injury appear to increase in a corresponding degree—despite all the precautionary methods enforced by the Legislature, or resulting from perhaps less stringent private experience and control. With the ever-growing use of electric and

steam power, the adoption of extensive and often most intricate machinery—confined very often in too limited spaces—the risk to life and limb cannot fail to be great in all large fields of labour. In some of these the *emp!cys* are counted by the hundreds and thousands—some percentage of whom must literally “carry their lives in their hands” in their daily pursuit of bread-winning.

To meet risks such as these—to say nothing of those accidents which occur daily and hourly in every city, and in some family or another in every part of the globe—noble institutions like hospitals, and less known establishments devoted to ambulance work, are already in existence. But experience proves that this is not enough. More needs to be done. What is required is that the masses, the people at large—if possible, every individual—should have a knowledge of their own bodies, and, in case of injury, know how to act and alleviate suffering until the arrival of medical assistance.

Many times we have seen in London streets a crowd gathered round, perhaps, a poor, ragged, and suffering person. There are those who, after just peeping, pass on; others stare out of curiosity; and some, with kind hearts, are doing their best for the sufferer; but, alas! how often in such a crowd is there the presence of anyone prepared to deal with the emergency.

It is impossible to over-estimate the result that would be attained if the young could be trained in First Aid. Thousands of minor injuries are occurring daily in our households, to say nothing of those of a more serious nature in respect to which such training would be invaluable. How often might bleeding be stayed, cuts carefully plastered, injured limbs placed in splints or bandaged up to prevent further hurt, foreign bodies removed from the eyes, and assistance given in many other directions, too widespread to enumerate, if First Aid training was more general than it is.

When we think of the vast number of lives lost annually by drowning, accidents in collieries, mines, and on railways—all points very clearly to the fact that the number could have been greatly reduced if those nearest at the time of accident had known something of those simple means which can be adopted to arrest hæmorrhage, prevent simple fractures from becoming compound, and resuscitate those apparently drowned or suffocated. Or, in the cases of some accidents, we may be far removed from medical assistance, while the injury is such that immediate aid is an absolute necessity in order to prevent a fatal result. Perchance the subject of the accident may

be someone very dear to us, and how we should then blame ourselves for not having given up the few hours, perhaps of leisure, which are required in order to obtain the knowledge needed to stay what is, perhaps, the very life-blood from fast flowing away.

We have only to leave such a thought with our readers. A little self-sacrifice—it may be the denial of a small amount of pleasure, would, under such circumstances, have placed us in a position that probably would have enabled us to save a very precious life.

Surely this should stimulate all to study the subject of Ambulance Work, with the view to making themselves proficient in bandaging, splinting, hæmorrhage arresting, and very many useful methods which can be resorted to by those anxious to join the ranks of efficient First-aiders. One and all, high born or lowly, should be acquainted with the many simple means that can be employed to render First Aid.

Truly this good cause of Ambulance Work is spreading; for an experienced worker may occasionally, in the public thoroughfares, be seen bent over the prostrate form, bandaging or acting in a way that will save the unfortunate person much agony pending the arrival of a doctor. Under some circumstances—as, for instance, in the Colonies—medical assistance may not be forthcoming perhaps for days or weeks. Then the First-aiders must put his best energies to his work, and do all that his training has fortified him to do.

But this is not sufficient. First Aid knowledge and practice should become universal. Every head of a family, every brother and sister should feel it to be his, or her, duty to know how best to act under some of those trying circumstances which we have indicated—conditions which are often only the more perplexing and alarming because of the ignorance on the part of the onlooker as to how best to act under the circumstances.

It is the object of these papers, with their carefully prepared illustrations, to provide those unable to attend Ambulance classes with self-instruction in First Aid; and we believe that any intelligent reader carefully studying the directions, and practising the various bandaging processes, etc., will soon be in a position to give invaluable—because sound—assistance to any suffering fellow-creature requiring temporary relief pending the assistance of the qualified practitioner.



CHAPTER I.

THE SKELETON.

IT is, in the first place, most essential that we should have a proper knowledge of the bony framework of the body. We shall, therefore, by the help of the accompanying diagrams, endeavour to simplify the subject as far as possible. If the reader has an opportunity at any time of examining an *articulated* skeleton (*i.e.* a set of the human bones joined together by wires and springs) it is very advisable to do so, as by this means the shape of the different bones will be impressed more firmly on the mind.

We have, in addition to the technical names of the various bones, added, on the diagrams, their proper equivalents. Many of the bones may be *felt on our own body*, and it is a good exercise to find them, and, at the same time, name them. After doing so for a few times we shall readily remember their names and positions, and, should we have to render aid in a case of fracture or dislocation, we shall then be able the more quickly to diagnose the injury. The special name given to the study of bones is Osteology, which word is derived from the Greek—*osteon*, bone, and *logos*, discourse.

THE BONES.—Bones are composed of two parts:—EARTHY, or inorganic, and ANIMAL, or organic material. At birth the bones consist almost entirely of animal matter, and therefore care should always be exercised when handling babies; for the bones may be so easily bent out of shape. This animal matter is frequently called gristle. As they grow older the bones become tougher, as they then contain more mineral, or earthy matter. In all households in the processes of cooking, bones are boiled to “get the goodness out,” and soup is made in this way. This “goodness” is the animal matter, and when it is extracted the bone still retains its original shape, but it is then entirely composed of earthy or mineral matter—chiefly phosphate of lime. For instance if a bone be burnt, some white, chalky substance remains; this is the mineral matter, the animal matter having been burnt up. Adults’ bones are made up of about two-thirds

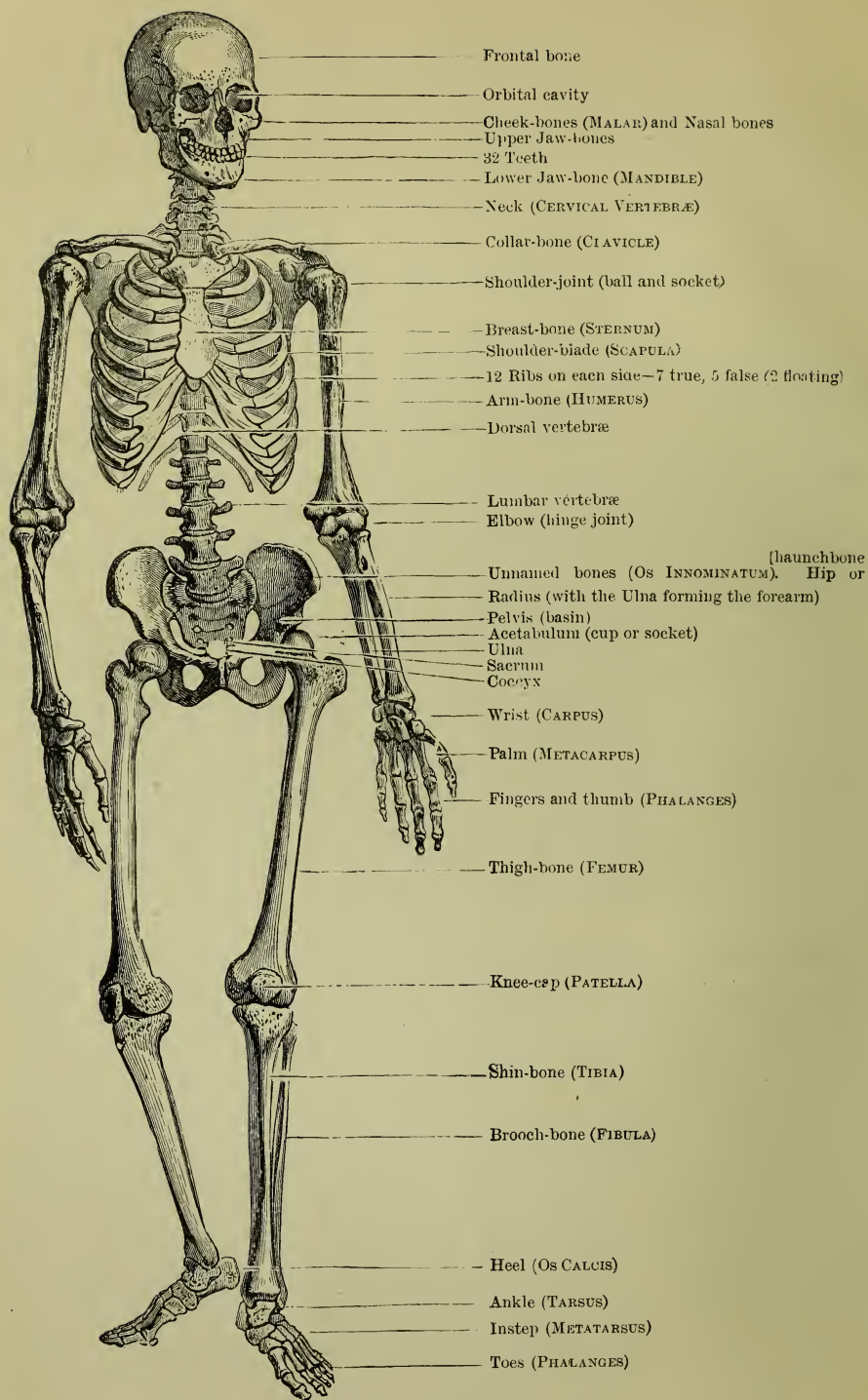


FIG. 1.—THE SKELETON (FRONT)

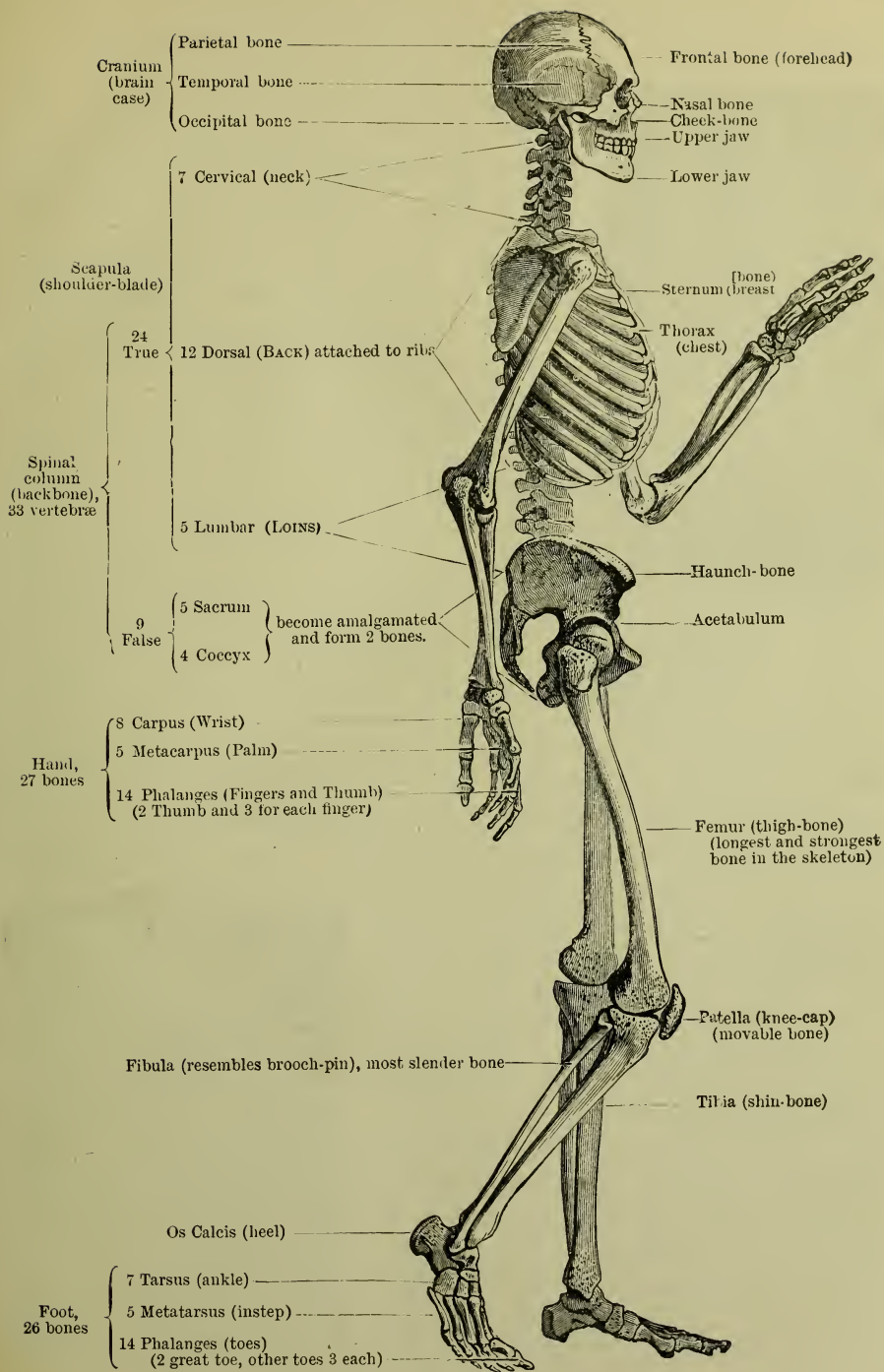


FIG. 2.—THE SKELETON (SIDE).



FIG. 3.—SECTION OF BONE.

mineral, and one-third animal matter. The bones are light; which is due to the fact that though they have a solid hard exterior, the inside is a regular network, resembling pumice stone (*see* Figs. 3 and 4). This makes them very much stronger than a solid material would be. A metal tube is stronger than a solid rod, and Nature adopts this principle in the process of bone making. In young children, who are not healthy, there is an insufficient deposit of lime, and hence the bone remains of a cartilaginous or gristly nature. Therefore they are likely to become deformed. This disease is commonly called Rickets, and care should be exercised that the child does not grow up bandy-legged, or knock-kneed; and it may be readily under-

stood that a baby should not sit up, as it is likely to create curvature of the spine. When anyone views a skeleton an idea is formed that the bones are a dry, dead mass, but in life this is not so. The bone is covered with fibrous tissue, called the Periosteum (from the Greek, “around a bone”), forming a tough skin; and this furnishes a great number of blood vessels, and the centre of the bone is filled with fat, which we call Marrow. There is a blood channel, or artery, in most bones, supplying the blood to the marrow direct, but the blood-vessels in the Periosteum, or outer membrane, supply blood to the bone. Bones enlarge in two different ways: by deposit through the Periosteum, and by a growth at the extremities. This bone-making is termed “Ossification.” In elderly people the bones lose most of their animal matter, and are therefore much more liable to break, being brittle.

The skeleton consists of about 200 bones of various shapes and sizes, viz.:—Long, short, flat, and irregular bones. It is divided into three parts—(1) the Head; (2) the Trunk; and (3) the Limbs. (*See* Figs. 1 and 2.)

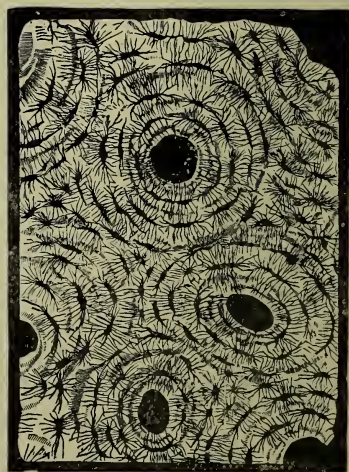


FIG. 4.—SECTION OF BONE.

THE HEAD.

The Head or Skull consists of the Cranium (brain case) and the bones of the face. The Cranium is composed of flat bones, those of adults are firmly knit together. In infants they are separated to allow of the growth of the brain. It will be noticed on examination of a skull that the edges of the bones are shaped like teeth and fit closely together, which adds greatly to its strength in resisting pressure.

There are eight bones forming the Cranium or Brain-case, which bear the following names:—(1) Frontal bone (Frons, “the forehead”); (2) Ethmoid bone (Ethmoides, “sieve form,” below the frontal bone); (3 and 4) Parietal bones (Paries, “a wall,” the top of the head); (5 and 6) Temporal bones (Tempora, “temples”); (7) Occipital (Occiput, “the back part of the head”); (8) Sphenoid bone (Sphenoides, “wedge form,” the front of the floor of the Cranium). The positions may be seen in Fig. 5.



FIG. 5.—THE SKULL

The face is composed of fourteen bones, seven of which go to form the nose. Two nasal bones form the bridge; one, Vomer (“a plough-share”), the ridge between the right and left nostrils; two, Lachrymal (Lachryma, a “tear”), which conduct tears from the eyes; and two, spongy bones, which form the inside of the nose. Then we have two upper jaw bones, two palate, two cheek or malar bones, and one lower jaw bone (*see* Fig. 1). The jaw-bones contain thirty-two teeth.

THE TRUNK.

THE SPINE.—The Spine, or Backbone, which fits into the Foramen Magnum (great opening of the occiput), a large aperture in base of the skull, is composed of a number of small bones, called Vertebrae (Verto, “to turn”). There are twenty-four TRUE and nine FALSE vertebrae. The true vertebrae are as follows:—Seven Cervical (Cervix, “the neck”), forming the neck; the two first of these being the Atlas (from its immediately supporting the head) (Fig. 6), and Axis (the process upon which it turns) (Fig. 7), which allow the head to be moved from side to side. There are twelve vertebrae forming the back, these are called Dorsal (Dorsum, “the back”), and

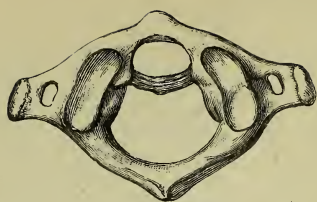


FIG. 6.—THE ATLAS.

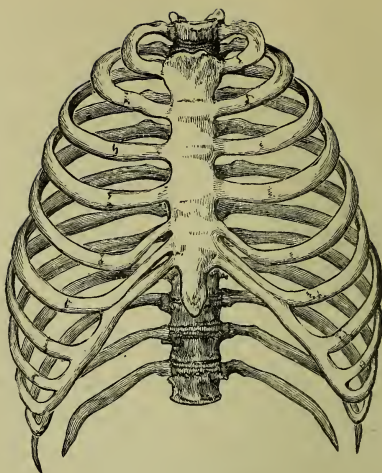


FIG 9 —THE RIBS.

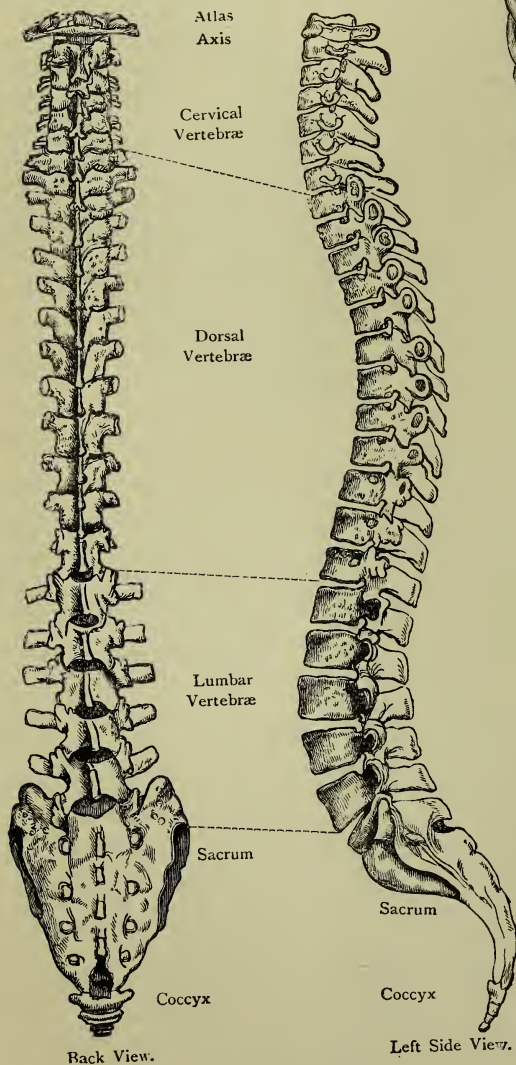


FIG. 8.—THE SPINE.

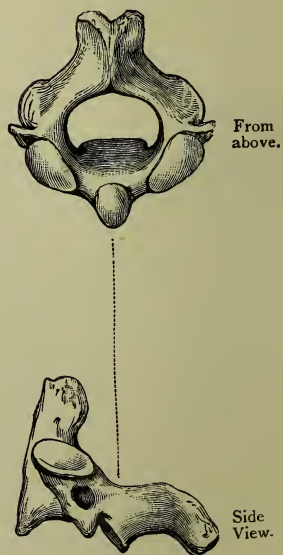


FIG. 7.—THE AXIS.

each bears a rib on each side. Five Lumbar vertebræ (Lumbus, "the loins"), form the loins. Of the nine false vertebræ, five go to form the Sacrum, and four the Coccyx (from the Greek, "resembling a Cuckoo's bill") (*see* Fig. 8). Thus they become welded together and form these two bones.

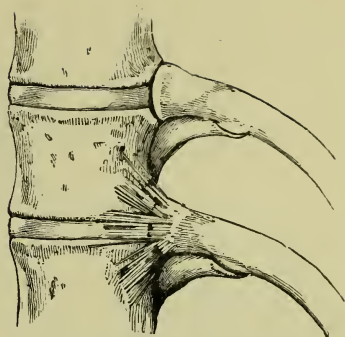
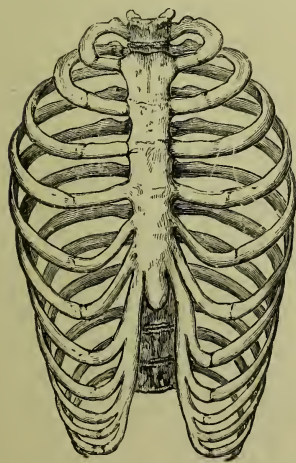


FIG. 10.—RIB ATTACHMENT.

THE RIBS AND BREASTBONE.—There are twelve ribs on each side (*see* Fig. 9) in both sexes, although some people suppose that men have only eleven on one side. Taking either side, the seven uppermost are connected with the Sternum or Breastbone (Latin—*sternum*, "a sword"). It will be noticed that the shape of this bone is similar to the ancient sword. These seven ribs are termed True Ribs, and the five lower ones bear the name False, as they are not attached to the breastbone. All the ribs are attached to that portion of the spine formed by the dorsal vertebræ (*see* Figs. 9 and 10), and then arch round to the front; and seven, as stated above, are attached to the breastbone. Three of the remaining five (false ribs) are joined to the seventh true rib, and the other two are called Floating Ribs, as they are not fixed in front. The ribs are of a cartilaginous character (gristle) where they join in front.

FIG. 11.—COMPRESSION OF RIBS
PRODUCED BY TIGHT-LACING.

Whilst speaking of the ribs it would be well for all to notice (*see* Fig. 9) the proper shape of the ribs in a healthy person, and then see from Fig. 11 what is done by tight-lacing. Common-sense will at once say: "The organs contained in the chest must be interfered with"; and so they are. The seeds of serious illness are often laid by this foolish fashion, and many have been carried to an early grave by persisting in its practice. It should be remembered that the chest contains the most important organs of the body, and any undue pressure brought to bear upon it prevents the proper functions of such organs from being carried out; and hence, sooner or later, the effects are felt, and then permanent damage is

done. This concludes our brief sketch of the skeleton as far as the head and trunk are concerned. This portion of the bony framework is usually called the **AXIAL** skeleton. We next proceed to

THE LIMBS,

or Appendicular Skeleton.

We first consider the thirty-two bones of the **UPPER LIMB**.

The *Shoulder Blade*, or *Scapula* ("a little boat"), extends from the shoulder joint towards the vertebral column. It is a broad, flat bone, triangular in shape (see Fig. 12), and so thin in places as to be almost translucent (transparent). This permits its gliding closely over the ribs. It has a cup on the outer edge into which the arm-bone fits. In order to allow free action to the arm, the cup in the shoulder-blade is very shallow, and thus the arm is easily put out of joint.

The *Collar Bone*, or *Clavicle* (*Clavis*, "a key") (see Fig. 13), is a double-curved bone something like the letter **S**. It extends from the shoulder-blade to the breast-bone horizontally, and acts as a prop or support to the shoulder.

The *Arm-bone*, or *Humerus* (Latin, "an arm or shoulder"), (see Fig. 14), is a long, strong bone, extending from the shoulder to the elbow. The upper end is round and fits into the cup on the edge of the shoulder-blade. The lower end fits on to the bones of the fore-arm, and is in shape something like a hinge.

The *Fore-arm* contains two bones, the **ULNA** and the **RADIUS**.

The *Radius* (Latin, "a spoke") is the larger bone on the outside—the thumb side (see Fig. 15). It does not join the humerus or arm-bone, but is jointed to the smaller bone, the *Ulna*, in a socket near the elbow. At the lower end it broadens out to form the wrist-joint. If we hold the arm out with the palm of the hand uppermost, and then

turn the hand palm downwards, we shall feel the radius turning over the ulna. It is fixed at the wrist.

The *Ulna* (see Fig. 16), is the smaller bone. It is broad

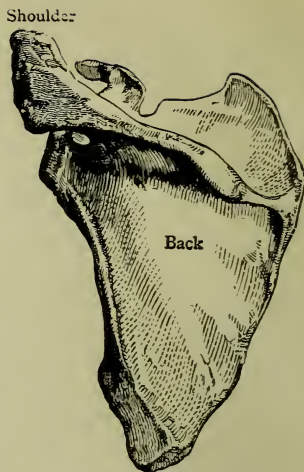


FIG. 12.—THE SCAPULA.



FIG. 13.—THE CLAVICLE.

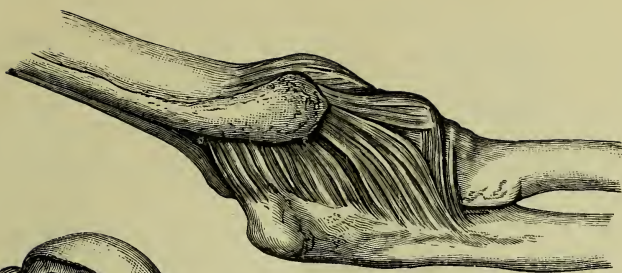


FIG. 17.

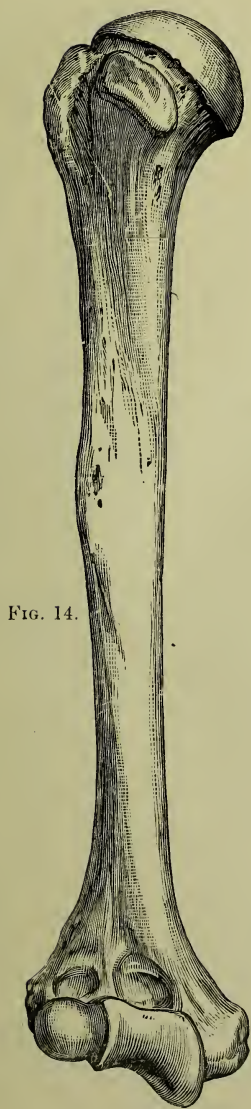


FIG. 14.

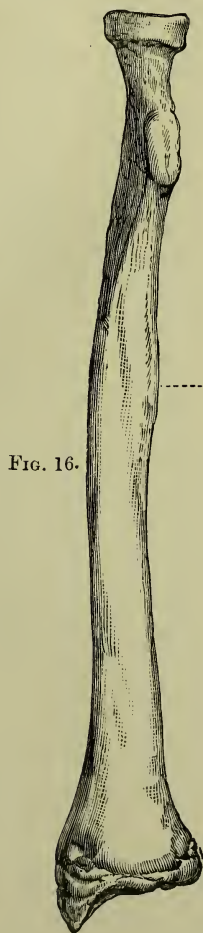


FIG. 16.



FIG. 15.

at the upper end, where it forms the elbow-joint (*see* Fig. 17), and small at the lower end, where it fits into a socket in the radius. The end of this bone makes the tip of the elbow, which is called the Olecranon (Latin, "an elbow-joint") process, and the projection of bone prevents the arm from bending backwards.

We can feel that these bones only come into contact at the ends, and that the ulna *only joins the arm-bone*, or humerus, and the radius *only joins the wrist*. The opposite ends of the two bones working on each other allow us to twist the hand about.

THE HAND.—First we have the eight bones forming the wrist, and termed CARPUS (Latin, "a wrist") (*see* Fig. 18). The reason we have such a number of small bones at the wrist-joint is to give a greater range of movement. Then we have the five bones forming the palm and called METACARPAL (Latin, "near the carpus or wrist") (*see* Fig. 19), which lead to bones, forming the four fingers and thumb, and which are termed PHALANGES. There are fourteen phalanges, three for each of the fingers, and two for the thumb. The word phalanges is from Phalanx, a part of an army (a battalion); the fingers stand in rows like soldiery.

THE LOWER LIMB commences with the pelvic girdle (Latin, Innominatum, "unnamed bone") (*see* Fig. 20), or as some say, the hips, and others the haunch-bones. We have a basin formed by these bones, and the Sacrum and Coccyx (the end of the spine), which supports the lower organs of the body. On the outside of the haunch-bones are two deep sockets into which the thigh-bones fit.

The Thigh Bone (Latin—Femur, "the thigh") (*see* Fig. 21) is the largest and strongest bone in the skeleton. The socket into which it fits is deep, and therefore it is less likely to be put out of joint than the arm-bone, as the socket in the shoulder-blade is shallow. The lower end of the bone is broad to form the knee-joint.

THE LEG BONES.—There are two bones in the leg—the Tibia and the Fibula—extending from the knee to the ankle. The larger one is called

The Tibia or Flute-bone (*see* Fig. 22), as it resembles an ancient

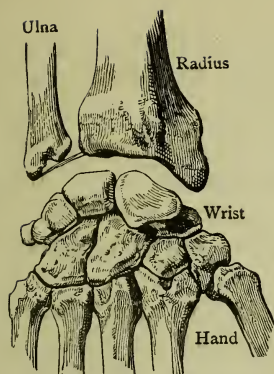


FIG. 18.—BONES OF WRIST.

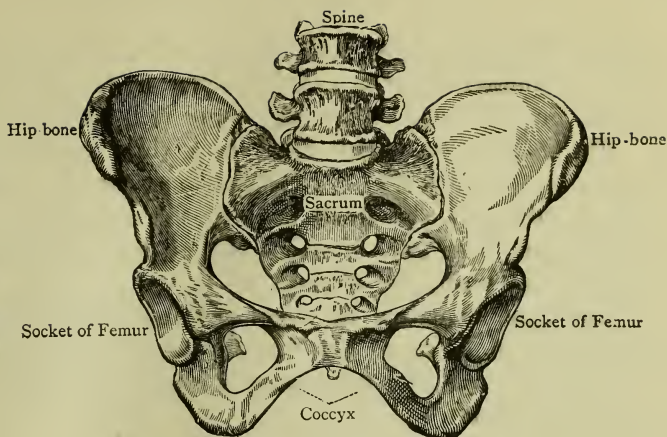


FIG. 20.—THE PELVIS.



FIG. 23.—BONES OF FOOT.

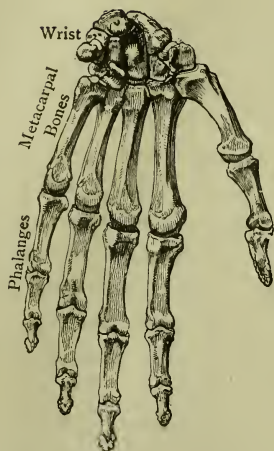


FIG. 19.—BONES OF HAND.

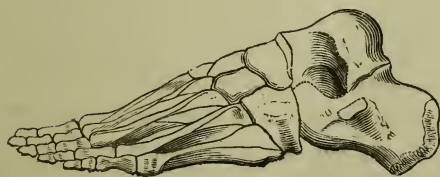


FIG. 24.—BONES OF FOOT.



FIG. 21.—THE RIGHT FEMUR.

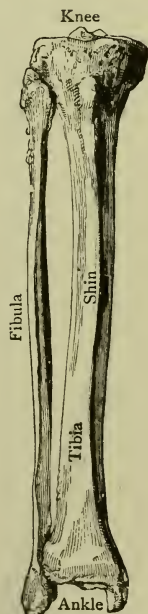


FIG. 22. — THE TIBIA AND FIBULA OF RIGHT LEG.

flute. *This bone forms both the knee and the ankle joints*, and therefore the construction of arm and leg differ in this respect. The Tibia can be felt on the front of the leg where it is called the shin.

The *Fibula*, or buckle-bone, is a thin long bone on the outer side of the leg (*see* Fig. 22). It is the most slender bone in the body. It corresponds with the small bone in the arm, but its action is different. It does not form part of either the knee or ankle joints, but it projects over the latter on the outside.

The bone-formation in the leg being different from the arm keeps the foot rigid. We do not want to turn it about as we do the hand.

The *PATELLA* or Knee-cap is a small bone which protects the front of the knee-joint.

THE FOOT.—There are twenty-six bones forming the foot (*see* Figs. 23 and 24). Seven of these form the ankle and heel, and are termed *TARSAL*. They are arranged in two rows forming the arch of the foot, and have to carry the weight of the body. The tarsal bone forming the heel is called the *OS CALCIS*.

Five long bones form the instep, and are termed *METATARSAL*. These lead up to the toes, which are formed by fourteen phalanges: two for the great toe, and three for each of the others. The number of bones correspond with those in the thumb and fingers, but differ in being shorter.

The reason we have so many bones in the foot is to enable us to have a free movement and spring, but it also prevents the shock we should otherwise get when jumping or even walking.

If we compare the bones of the upper limb with those of the lower limb (*see* Fig. 25), we find that whilst the shoulder-blade is so thin and movable, the haunch-bone is as stout and firm; the shoulder-joint is weak compared with the hip-joint; the elbow and knee differ, the one being so much weaker and more slender

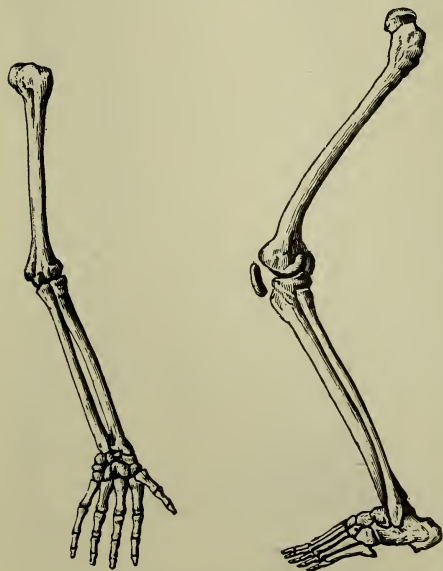


FIG. 25.—LEG AND ARM-BONES COMPARED.

than the other; the wrist can be moved in various directions, whilst the ankle can only be used as a hinge; the hand can grasp anything or palm it, but the foot cannot. The bones in the lower limb are much stronger.

It is very necessary for us to retain an idea of the bony framework or skeleton always in our mind, and we cannot too strongly emphasise the remarks made at the opening of this chapter, that all who can should examine a human skeleton, as this will help them not only to retain the names and positions of the bones, which is so essential in rendering First Aid, but will also show the wonderful manner in which the various bones are fitted and placed.

CHAPTER II.

OUTLINES OF ANATOMY.

THE MUSCLES.—In the last chapter we dealt with the bony framework of the body or skeleton. Attached to this framework are masses of fibrous tissue called muscles. They are the soft reddish substance lying immediately under the skin, which we call flesh. All the flesh of animals, fish, or fowl we eat is muscle. There are two kinds of muscle: (1) Voluntary, and (2) Involuntary. The former are capable of contraction, and are under the control of the will, and it is by this means that the various movements of the body and limbs are effected. They are red in colour, and so are the muscles of the heart, but these are involuntary, as we cannot regulate the heart's action. Voluntary muscles are, as a rule, thicker in the centre, they taper at the ends, and terminate in a band of tissue called sinews or tendons (*see* Fig. 26).

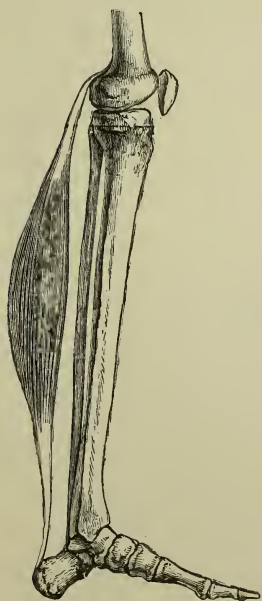


FIG. 26.—MUSCLE AND TENDON.

The muscles act much in the same way that an elastic band would if it were put over the forefinger and thumb. If you stretch the finger and thumb apart the elastic will pull them into position again. Involuntary muscles are whitish in appearance, and are connected with the abdominal organs, such as the Diaphragm, Stomach, and the Intestines. All muscles have their supply of blood, and therefore have arteries and veins, and of course nerves. One of the best illustrations of muscle-power is given by the biceps muscle on the front of the arm. It will be noticed when the will vigorously enforces the lower arm to bend, this muscle shortens and thickens and becomes much harder. The various muscles should be employed regularly, and then their endurance is much greater. The strongest muscles are in the legs; they are also powerful in the shoulders and arms. The largest muscle is the Diaphragm, supporting the lungs, and dividing the chest-cavity from the abdomen (*see* Fig. 34).

TENDONS, or SINEWS.—The muscles usually terminate in white-looking fibrous cords called Tendons, which are of great strength. The strongest one may be felt at the back of the ankle, where it is attached to the heel. This is called the Achilles tendon. The tendons are joined to the bones in many directions, varying according to the work to be performed.

THE NERVOUS SYSTEM.

The Nervous System is the most wonderful and complicated mechanism of the body. We commence with the Brain. This is divided into three parts, all of which are contained in the Cranium or Skull. These parts are as follows:—

1. The Cerebrum (*see* Fig. 27), or large brain, and seat of the intellect and will-power.



FIG. 27.—THE BRAIN.



FIG. 28.—SECTION OF BRAIN.

2. The Cerebellum (*see* Fig. 27), or small brain, is placed below the large one. From this runs the nerves operated upon by the mind or will to all the muscles, enabling them to regulate the movements of the limbs.

3. The Medulla Oblongata (*see* Fig. 29), is a band of brain matter connecting the cerebellum and the cerebrum with the spinal cord, which it joins at the *Foramen Magnum*, an opening in the base of the skull.

A sectional view of the brain shows it to consist of grey and white matter. The cerebellum, cut through (*see* Fig. 28), shows the white matter looking like a portion of a tree inside the grey matter.

THE SPINAL CORD.—The Spinal Cord (*see* Fig. 29) runs through the centre of the vertebral column or backbone: first of all through

the Atlas and Axis, and then through the neck or Cervical, the back or Dorsal, and the loin or Lumbar vertebræ; and from the side thirty-one pairs of nerves pass to the body and limbs.

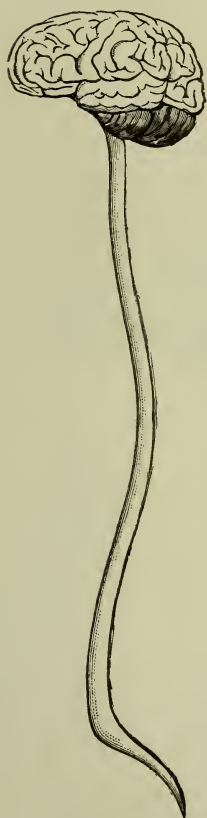


FIG. 29.—THE SPINAL CORD.



FIG. 30.—NERVES.

The brain and spinal column, in addition to the protection they receive from the skull and backbone, are protected by three membranes, and they are well provided with blood-vessels. The brain is not properly formed until the seventh year, and thus young children's

minds should not be too much exerted. Deep, uninterrupted sleep is required by the brain. All voluntary action is then at rest. Children and invalids should sleep as much as possible. The strong and healthy require not less than seven hours' sleep during each twenty-four hours.

THE NERVES.—The Nerves in appearance are like a number of white threads in all regions of the body (*see* Fig. 30). There are three classes of nerves:—

1. Motor Nerves: those which convey the message to the muscles and make them act.

2. Sensory Nerves: which convey sensations to the brain, and by which we feel pain. Suppose the finger is burnt with a match: the sensory nerve conveys the pain to the brain, and immediately a message is sent by the motor nerve, and the finger is drawn back from the flame.

3. Sympathetic Nerves: these govern the circulation of the blood and the organs of the body.

The nerves may be compared to a telegraphic system—so quickly are messages transmitted to and from the brain. We have nerves devoted to the senses of seeing, hearing, smelling and tasting, and those which convey the sense of touch. The latter are stronger in certain parts, as for instance, the ends of the fingers. These are, so to speak, entrances to the brain, for they convey sensations from outside. There are also nerves which allow us to reason out a matter involving thought.

THE EYE AND EAR.—It is very necessary that we should have some knowledge of these two organs of sense.

THE EYE.—The eye is the most important of the five superior senses named above. Most people are averse to touching the eye, and rightly so, for it should be very delicately handled. Its surface is always moist, as a gland is constantly supplying tears from the upper portion, which are conveyed over the eye and carried away by a duct to the nose. When we cry it is an excessive flow from this gland which being too much to be carried away by the duct flows therefore over the cheeks. Figs. 31 and 32 give an idea of the wonderful construction of the eye, but it is not necessary that we should go into particulars. It is with this most wonderful organ of sight that we

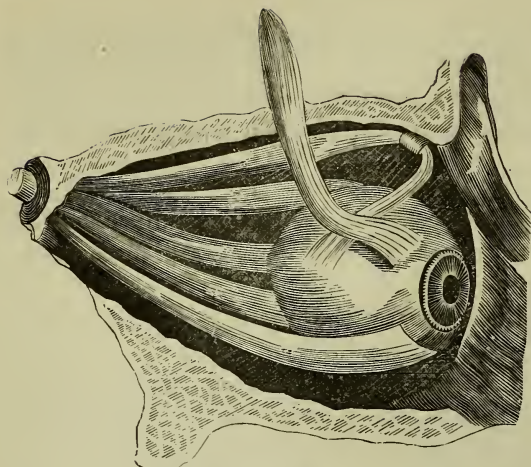


FIG. 31.—THE EYE.

perceive light and colour, and not only this, but also all that which gives pleasure and sorrow. The mind is principally influenced by the eye.

It is remarkably well protected, lying as it does in the cavity provided in the skull, and externally by the eyelids and eyelashes. The eyelashes prevent perspiration rolling into the eyes when it trickles down the forehead. We may notice

how the eyelids close, almost involuntarily, when danger is near.

In the diagram (Fig. 31) may be seen the six muscles with which the eye is turned in various directions. Squinting is caused by one of these muscles being shorter than the others. For a sectional view of the eye *see* Fig. 32.

The eye requires great care if we wish to enjoy the many benefits this organ of sense bestows. If any sign of disease makes itself known, medical aid should be sought at once. Many diseases of the eye are incurable, but the progress of any malady may often be considerably arrested.

Great care should be taken not to expose the eye to strong light, and the working with the sunshine on work is mischievous. Reading in too much light is as dangerous as it is in too little light. It is better to sleep in a darkened room with the face from the window. It is a bad habit to read in any vehicle in motion, particularly in trains, and reading anything over the face of which strong shadows are passing is injurious.

Cleanliness is most essential for the eyes. Sight is a great blessing, and we should all learn to value it more, and take greater care of the eyes.

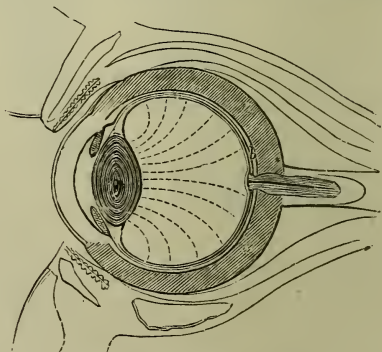


FIG. 32.—SECTION OF EYE.

There is a growing prevalence among young children to need spectacles; this is a sad condition, and one for which much could be done by way of prevention. Children should not be kept too closely at books or study; the method of training should vary, and then the eyes would get the rest they require. They do not want to be confined to reading at a certain distance, and they should not be subjected to any great or sudden changes. Young and old should never go behind anyone to put their hands round the face and over the eyes, to make the victim guess: "Who is this?" It is a very dangerous practice,

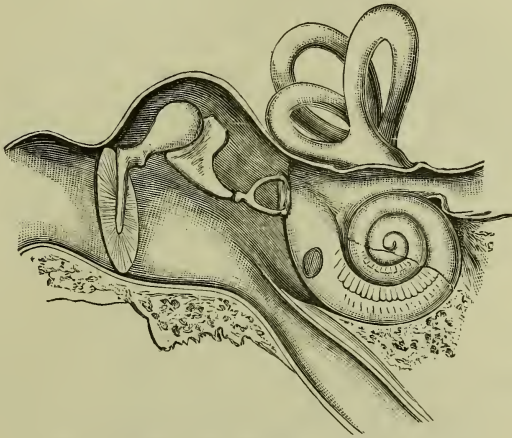


FIG. 33.—THE TYMPANIC CAVITY OF THE EAR.

and might result in blindness. Little, thoughtless actions, such as these, often have very serious results.

THE EAR.

THE EAR.—The sense of hearing is second only to that of seeing. The ear, as we see it, is not actually the organ of hearing; in anatomy this portion is spoken of as the **AURICLE**. It collects the sound, which is then passed down the external auditory passage (*see* Fig. 33), at the end of which we have the **TYMPANUM**, or drum, and beyond this the tympanic cavity. In this cavity is the Hammer attached to the tympanum, then the Anvil and Stirrup, a series of small bones which are commonly called by the above names as their shape or action resembles such articles. They convey the movements of the tympanum to the Oval fenestra, which then vibrates, and the sound is conveyed through the inner ear to the brain. It is not needful that First Aid students should have a

great knowledge of the sense of hearing, and therefore we do not explain the movements of the inner ear. From the middle ear, or tympanic cavity, there is a tube connected with the Trachea, or wind-pipe, called the Eustachian tube. It will be seen at once that this organ of sense is of very delicate construction, and when any disturbance in it is detected a medical man should be consulted.

Wax should be removed from the ear very carefully. Never use anything with a point for the purpose. It is a bad practice, also, to put wadding into the ears. Should this be done when in a draught, remove the wadding when getting into a room of proper temperature. The wadding will heat the ear, and therefore care must be taken not to remove it in a cold temperature.

It is very dangerous to box children's ears. The tympanum, or drum, may be injured by this means, and also by violent sounds, such as firing cannon. Shouting into the ears is also to be avoided, and care should be taken not to get the feet damp, as this affects the ears. Pure air and proper ventilation are also necessary to avoid disorders of the organ of hearing.

THE SKIN: THE SENSE OF TOUCH.

THE EPIDERMIS.—The sense of touch lies in the skin with which our bodies are covered. The outer skin is termed the Epidermis; it is a horny substance, without blood-vessels or nerves. This can be easily tested. When we get a blister there is no pain in its skin, and with corns there is no pain in their horny exteriors which we are accustomed to cut off. Those who sew a great deal injure the outer skin of the first finger, but do not suffer pain. The sense of touch is in the nerve ends just below the horny skin; it is finest at the finger-ends, palm of hand, and tip of tongue. The nails are growths of the outer skin, and give strength and power to grasp any object with the fingers. The epidermis is a source of protection to the true skin.

THE DERMIS, or TRUE SKIN.—The second skin contains the organs of touch, and is full of vessels and nerves. When we get a bruise, some of the blood-vessels are broken, and thus we get discoloration. The secreting organs are in the true skin, but open in the pores of the epidermis, and thus secrete perspiration. The hair-sacs (follicles) have their bases in the Dermis. The hair is horny, like the outer

skin, and without vessels or nerves. Small muscles are attached to these follicles, or hair-shafts, and thus when we receive a shock we get what is called "goose-skin," and the hair, so to speak, "stands on end."

Below the dermis we have a third membrane, consisting of fat cells which prevent the escape of warmth from the body. The skin

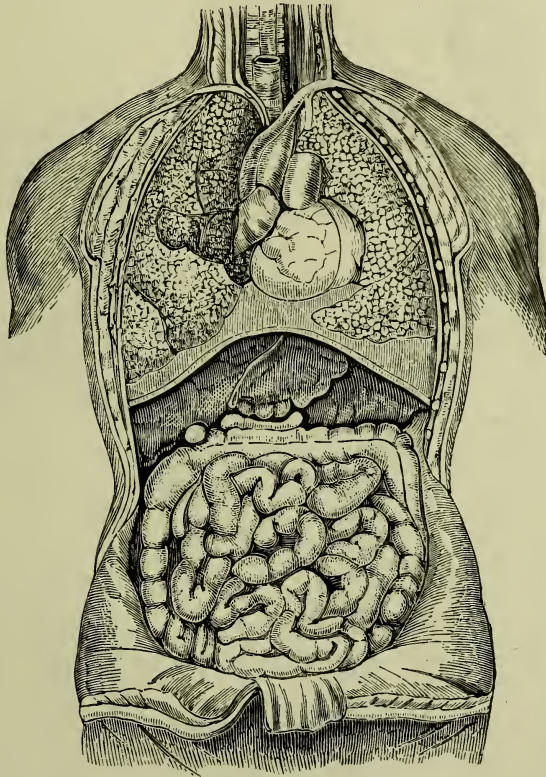


FIG. 34.—THE TRUNK OR BODY.

covering the cavities in the interior of the body, such as the mouth, nose, or stomach, is called the Mucous Membrane. Good health in a great measure depends on keeping the skin scrupulously clean. If this is not done, perspiration is prevented, and it is essential that the pores should be kept open. Soap is necessary to dissolve dirt, and if not used the pores would be stopped up.

When heated be careful to cool slowly. If we catch cold, induce perspiration by drinking hot tea, or coffee, or by lying between blankets.

This will lessen the consequences. Suppressed perspiration will cause a cold. Sufferers from perspiring feet should wash them frequently, and often have a change of socks.

Blisters should be pricked, *not cut*.

Regular exercise is good for the skin, and so is bathing; but one must gradually get accustomed to the cold bath. It is very dangerous

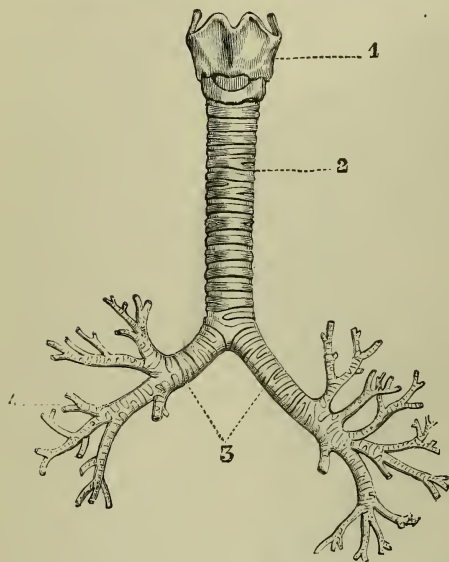


FIG. 35.—THE THORACIC ORGANS.

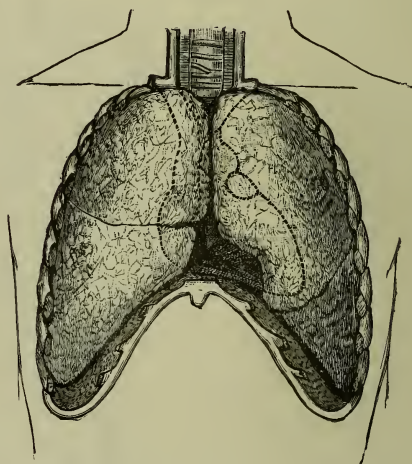


FIG. 36.—THE LUNGS.

to paint the skin, and very unwise to wear tight fashionable boots or shoes. See that children wear properly-shaped apparel for the feet.

THE SENSE OF SMELL.

The sense of smell is in the nasal cavity. In the upper part of the mucous membrane in the cavity are the nerves of smell, termed the Olfactory Cells. By means of these cells we smell with the nose. If the mucous membrane of the nose be weak, inject tepid water up the nostril, and gradually work to quite cold water. Insects often get into the nose when smelling flowers, and create disease or injury.

The sense of smell is impaired by working or living under the constant influence of any strong smell.

THE SENSE OF TASTE.

The sense of taste lies in the tongue. It is injured by drinking hot

beverages and excessive smoking. A full sense of taste is needful for good health, as taste will refuse to admit to the stomach anything harmful.

THE TRUNK OR BODY.

The interior of the human body is depicted in Fig. 34. We will deal first of all with the upper portion.

THE CHEST CAVITY or THORAX.—This is sometimes called the Chest Box. It is formed by the twelve dorsal vertebræ, the ribs and breastbone, and is strengthened by the shoulder-blades or scapulæ, which cover a portion of the ribs. It is separated from the abdominal cavity by the diaphragm, sometimes called the midriff, a muscle which it will be noticed is in the form of an arch. The principal thoracic organs are as follows: The Larynx, or voice-producer; Trachea, or windpipe, extending from the larynx and conveying air to and from the lungs; the Pleura, and the Heart. These are the main organs of respiration and circulation of the blood. The trachea is kept open by a series of rings of gristle. In Fig. 35, 1 represents the larynx; 2 the trachea; and 3 the bronchi, through which air is conveyed from the trachea to the lungs. The thorax and its contents are depicted in Fig. 36. The lungs, or organs of respiration, are similar to sponges (*see* Figs. 37 and 38). The heart lies between the two lungs in the lower part of the chest; we give particulars of it in the next chapter, in dealing with the circulation of the blood.

THE ABDOMINAL CAVITY.—Below the diaphragm we have the abdominal cavity which contains the liver, spleen, kidneys and stomach, but it is chiefly occupied by the intestines, which are a continuation of the stomach. We should have a knowledge of the position of these organs. The liver is on the right side of the body, just under the ribs. It is brown-red in colour and weighs about fifty or sixty ounces. The spleen is on the left side of the stomach. This is a gland connected with the development of the blood. It receives the

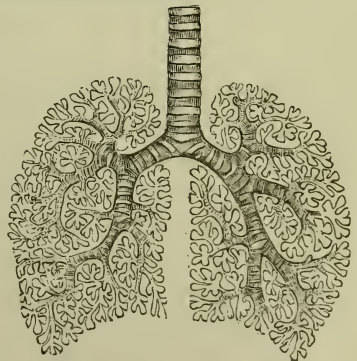


FIG. 37.—SECTION OF THE LUNGS.

digested food and produces the bile which further assists in the digestion. The kidneys (*see* Fig. 39) are placed in the loins, on each side of the spine. They carry off superfluous matter from the system. 1 represents the right; 2 the left kidney; 3 the vena cava; 4 the aorta; 5 the ureters. In other words the kidneys are the organs of excretion. The waste product is carried by the ureters to the bladder.

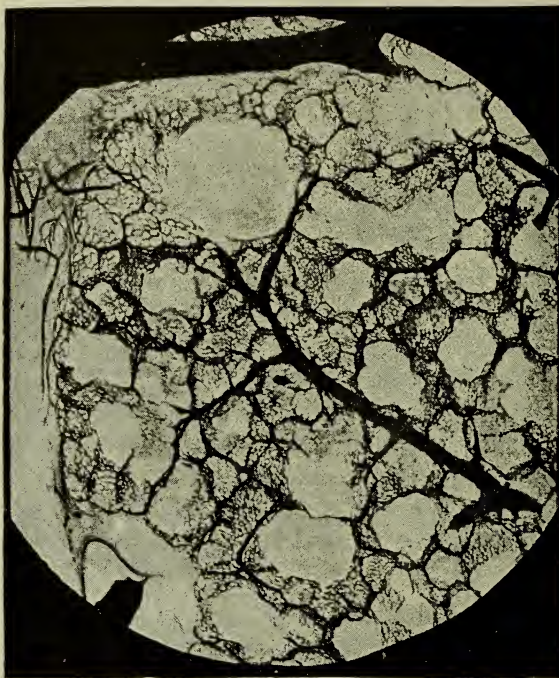


FIG. 38.—SECTION OF THE LUNGS.

THE ALIMENTARY CANAL.—This is the organ of digestion (*see* Fig. 41). We masticate the food in the mouth and mix the same with saliva; it then becomes what is termed a Bolus (or lump). This is then swallowed and carried down to the stomach by means of muscles in the Gullet. The food, when it reaches the stomach, is, so to speak, churned by muscular action, and becomes mixed with Gastric juice, which is given out by the mucous membrane which lines the whole of the Alimentary Canal.

The food enters the stomach (*see* Fig. 42) by the (1) Cardiac orifice, and is then converted into a pulp known as CHYME, after which

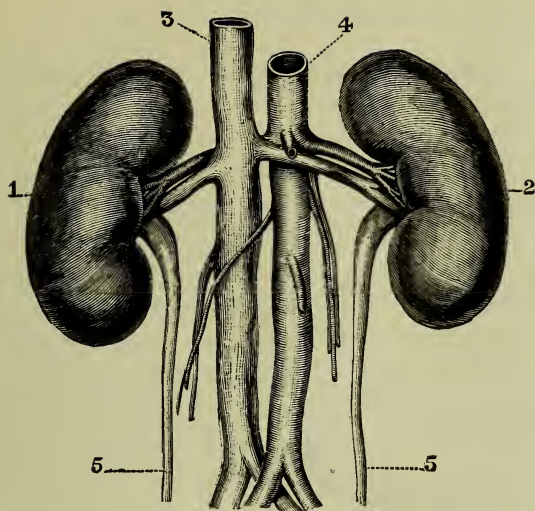


FIG. 39.—THE KIDNEYS.

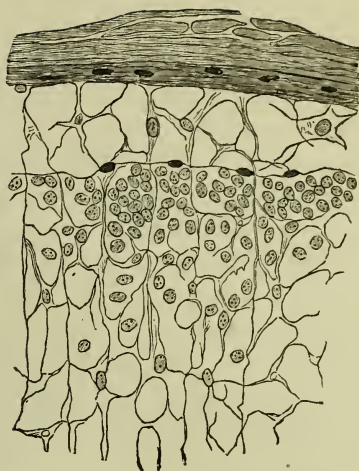


FIG. 40.—THE LYMPHATIC GLANDS.

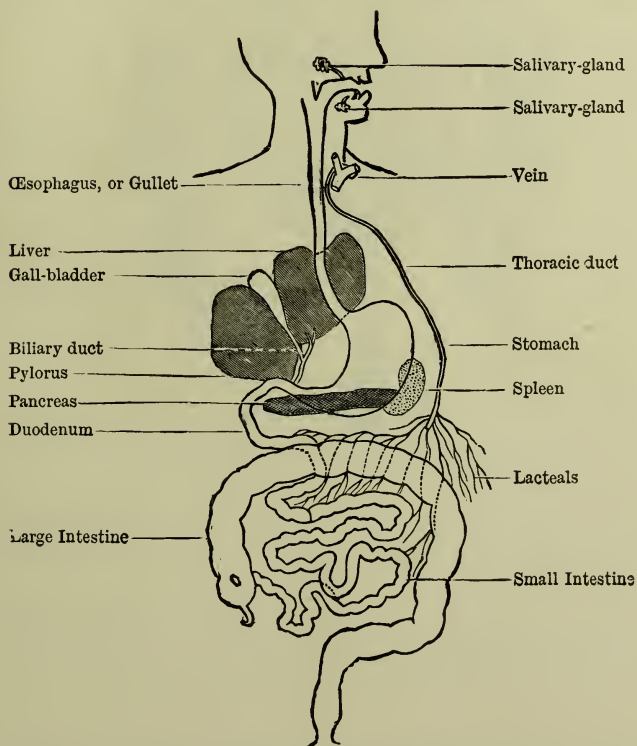


FIG. 41.—THE ORGANS OF DIGESTION.

the (3) Pylorus Valve relaxes and the Chyme passes out into the (4) Duodenum, and thence to the small intestines. Here digestive fluids are poured from the PANCREAS and liver, also from the glands in the small intestine itself. The fatty materials are not changed until they reach the small intestine, then the bile makes them capable of absorption, and the undigested food is passed out from the body.

The chyme (Chymus, "juice") is absorbed by the Lacteals (Lacteus, "milk") and now known as CHYLE. These lacteals eventually discharge

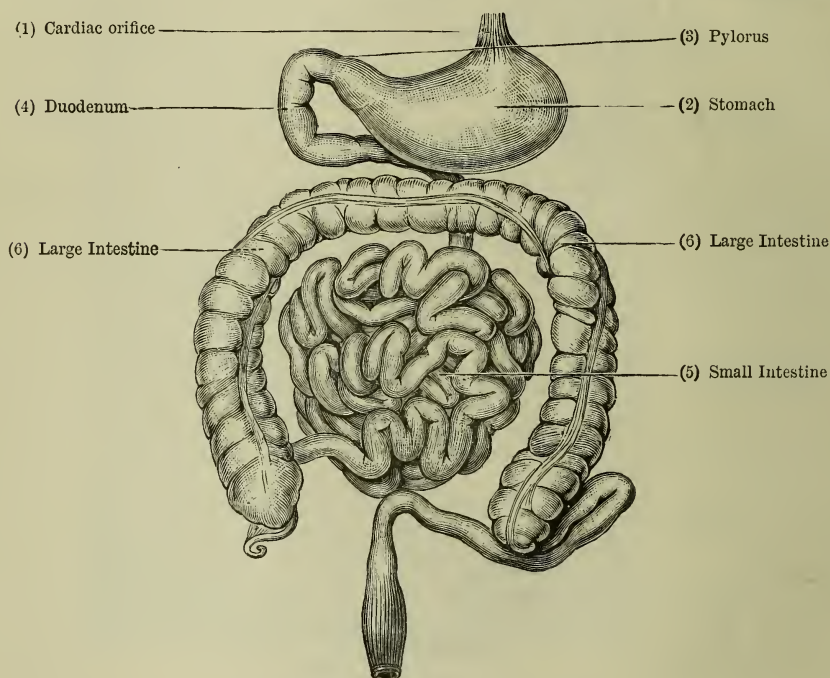


FIG. 42.—THE STOMACH AND INTESTINES.

themselves into the thoracic duct, which is connected with the veins at the neck (*see* Fig. 41). Here the food comes in contact with the blood.

Through the body are a number of small vessels resembling the Capillaries (the minute blood-vessels). These are known as the

LYMPHATIC VESSELS (Lympha, "lymph"). They receive the overflow from the capillaries, and, after passing it through the Lymphatic

Glands (*see* Fig. 40), which are small oval bodies, resemble a filter in their action, and it is conveyed into the Thoracic Duct.

The Abdomen is lined by a membrane known as the PERITONEUM (Greek, "stretched over").

It is necessary for us to become acquainted with the organs of digestion, for we may then render the early principles of First Aid. Indiscretion as to diet is the cause of many illnesses, or much pain. Children often suffer because their parents do not study in any way what is good or bad for them to eat. They should on no account be allowed to eat between meals; it makes them dainty. The reason we can stay without food for a time is that the liver keeps a store after absorption, otherwise we should simply live to eat.

CHAPTER III.

THE BLOOD.

HAVING given a small idea of the absorption of foods into the blood, we now deal with the CIRCULATORY SYSTEM, as this is the means by which food nourishes the body.

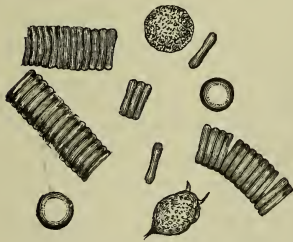


FIG. 43.—BLOOD CORPUSCLES.

The weight of blood in a fully-developed person is about twelve pounds. Fresh blood in the arteries is of a bright red colour, while that contained in the veins is a darker or purple colour. A drop of blood when seen under a microscope gives it a very different appearance from what the usual idea is—viz., a thick red fluid. It is really a transparent fluid, in which are to be seen floating a large number of minute circular bodies, called Blood

Corpuscles (*see* Fig. 43). The transparent fluid is termed the Plasma of the blood, and contains albumen, fibrin, and the following gases:—oxygen, carbonic acid, and nitrogen. It is the fibrin in the fluid which enables the blood to coagulate, or, as we say, “clot.” There are two kinds of blood corpuscles—red and white—a preponderance of red corpuscles gives the colour to the blood. The red also are the means by which oxygen is carried through the system.

THE CIRCULATION.

With the above small idea of the blood, which is sufficient for the purposes of First Aid, we now proceed to explain the wonderful system by which it is circulated to all parts of the body. The great organ of this system is the HEART (*see* Fig 44), which lies almost in the centre of the thorax, or chest-box, inclining to the left side. The heart is commonly regarded as one organ, whereas it is really two. We speak of the right side and the left, but when we explain that each does a separate work, it is better for us to think of the right and left sides as two separate hearts. Each side, or heart, consists of an upper cavity, called the

AURICLE, and the lower cavity, called the VENTRICLE. Thus we have two auricles and two ventricles. The right auricle, or top chamber, receives the Venous, or impure blood from the SUPERIOR VENA CAVA and the INFERIOR VENA CAVA; the auricle contracts and forces the impure blood into the right ventricle, through a valve of such construction that the blood cannot return, but goes in a fixed direction. The ventricle next contracts and forces the blood through the PULMONARY ARTERY (Pulmo, "lung") to the lungs, where it is purified, giving off impure gas, taken up from the system, and absorbing fresh oxygen, which is breathed into the lungs with each respiration.

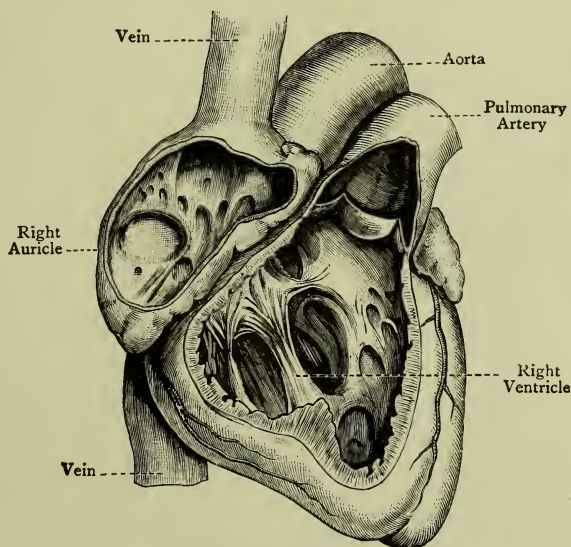


FIG. 44.—SECTIONAL VIEW OF THE HEART.

The blood then returns by the four PULMONARY VEINS in a pure state to the left auricle of the heart; this contracts and forces the blood through the valve into the left ventricle, the ventricle contracts likewise and forces the blood through the AORTA into the circulatory system. The left ventricle is the strongest cavity of the heart, as it has to force the blood over the whole body. The two auricles contract at the same time, and afterwards the two ventricles. If we listen in the region of the heart we hear the double sound.

The left side of the heart deals with the pure blood, and the right side with the impure; and therefore the left may be termed the ARTERIAL heart, and the right the VENOUS heart.

The Aorta (Greek, "suspend") is a large tube, about an inch in diameter, and this supplies the various arteries. They, in turn, become very small, and then the blood nourishes the system in the CAPILLARIES (Capillus, "hair"), and is afterwards returned by the veins to the right auricle of the heart. The same process is repeated over and over again, and this constitutes what is known as the circulatory system.

In the diagram (Fig. 45), the numbers indicate :—

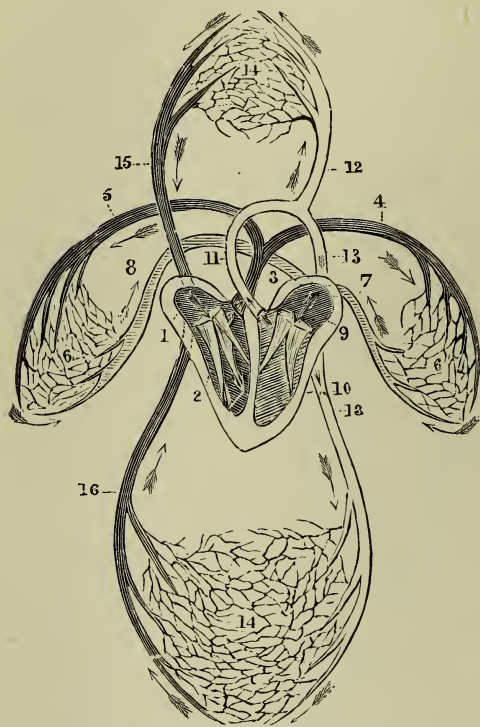


FIG. 45.—CIRCULATION OF THE BLOOD.

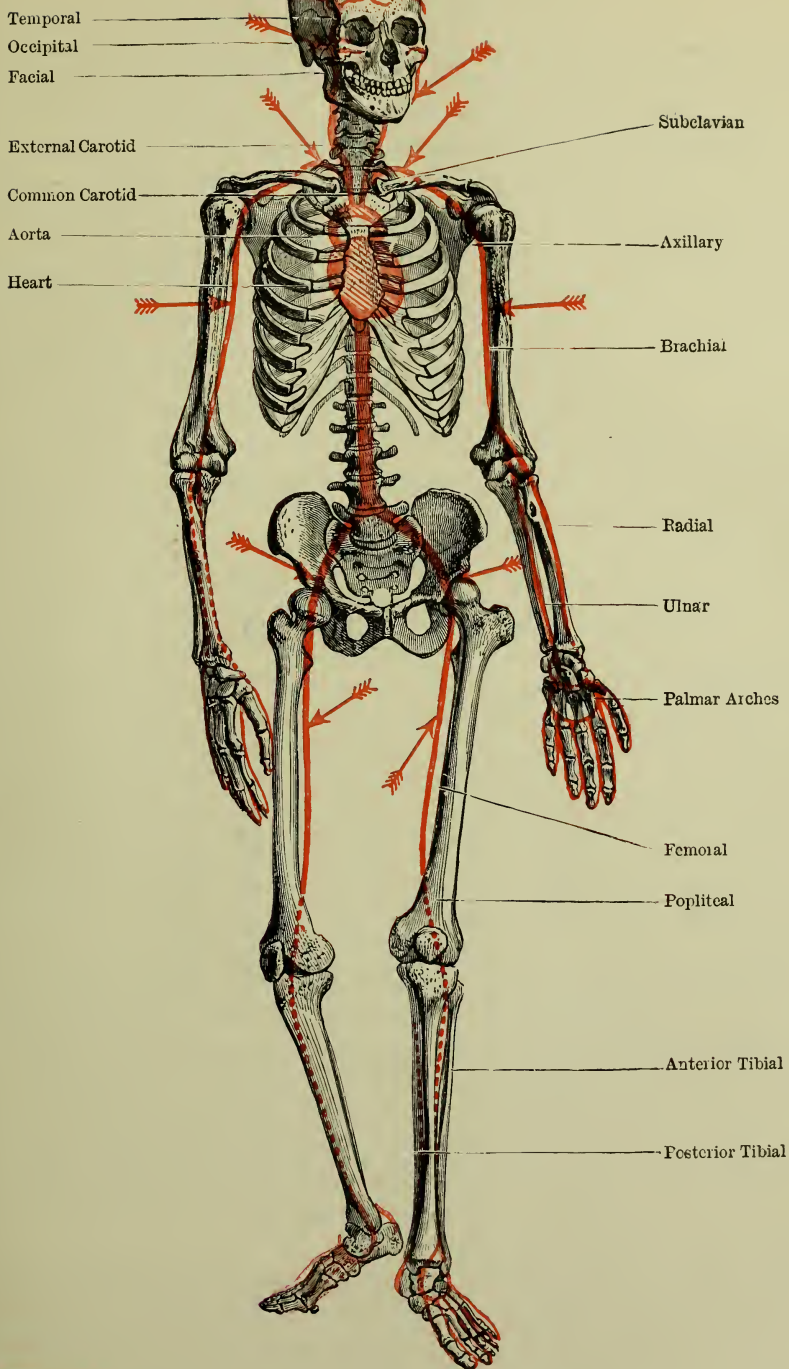
1. Impure (shaded) blood, entering the right auricle from above and below.
2. Right ventricle.
- 3, 4, and 5. Pulmonary arteries.
6. Lungs.
- 7 and 8. Pulmonary veins.
9. Left auricle.
10. Left ventricle.
11. Aorta.
- 12 and 13. Arteries.
14. Capillaries.
- 15 and 16. Veins.

ARTERIES.—The blood, fresh and pure from the heart, is passed through the large, crook-shaped vessel called the AORTA

(see Fig. 46), and then through a branch on the right side of the arch called the INNOMINATE, after which arteries run in the following directions :—

- Head and neck—right side.
- Right arm.
- Head and neck—left side.
- Left arm.

The artery going to the right side of the head and neck is the COMMON CAROTID, and the one serving the right arm is the SUB-CLAVIAN. The arteries on the left side of the head and neck, and the left arm, have the same names as those on the right. The Common Carotid on the left



POINTS FOR APPLYING DIGITAL PRESSURE TO ARREST ARTERIAL BLEEDING.

FIG. 46.—SKELETON SHOWING POSITION OF MAIN ARTERIES.

side is longer than that on the right side, because it comes directly from the Aorta. It is the Common Carotid which is injured when a person attempts suicide by cutting his throat. The Common Carotid divides into smaller branches called the External and Internal Carotids. The external carotid divides into various branches, but we need only deal with the Facial artery, for the face; the Temporal artery, for the front of the scalp; and the Occipital artery, at the back of the head.

The Subclavian artery bears the name because it passes behind the CLAVICLE, or collar-bone. At the arm-pit it is termed the Axillary, and it then follows the arm-bone (humerus) under the designation BRACHIAL. At the elbow it divides into two, and these are named after the bones in the lower arm, RADIAL and ULNAR arteries. The radial artery enters the palm of the hand from the back, and the ulnar from the front. They then form two arches called the Palmar arches (palma, "palm"). Branches go from these arches to the thumbs and fingers.

Branches for the supply of blood to the head and upper limbs having been given off, the aorta continues its way downwards. It follows the course of the vertebral column or spine, and is protected by the same. The Aorta divides into two in the loins, each being called the COMMON ILIAC (right and left). They branch off towards the limbs they have to supply, and then divide again into two, the EXTERNAL and INTERNAL ILIAC arteries. The internal iliac supplies the PELVIS, and the external iliac enters the lower limb at the centre of the fold in the groin—it may be felt pulsating at this point. It then becomes the FEMORAL artery on account of its close proximity to the thigh bone or FEMUR. Following a line from the centre of the groin to the inside of the limb, it eventually reaches the back of the knee-joint (POPLITEAL space), where it is called the POPLITEAL artery. It now divides into two as the Brachial did in the forearm. One branch passes down the front of the leg, near the larger bone (Tibia, "shin-bone"), and the other at the back of the shin-bone. The one in front is termed the ANTERIOR TIBIAL artery, and the one at the back the POSTERIOR TIBIAL artery. They can be easily felt at the ankle, where the anterior tibial passes into the foot on the top of the instep, and the posterior tibial supplies the sole of the foot, and forms an arch for the supply of the toes.

We cannot see the arteries because they are so deeply imbedded for protection, but in several places we can feel them beating—for instance in the temple (in front of the ear), at the wrist (or, as it is called, the pulse),

in the groin, at the ankle, and on the instep. The pulsation is caused by the ventricle of the heart driving a fresh supply of blood into the system. The blood in all arteries is pure, except in the Pulmonary artery, which conveys the blood to the lungs to be purified. The arteries are strong elastic vessels, which remain round even when empty. It will thus be seen that the walls of the arteries can dilate, and carry the amount of blood forced into them by the left ventricle as it cannot return to the heart. The PULSE, that is, the contraction of the left ventricle, takes place in an adult about seventy times a minute, in a child or elderly person it is more rapid. When the heart works very rapidly, it is termed palpitation.

THE VEINS.—We can trace the veins in many parts of the body, and they are seen to be of dark bluish colour. The walls of the vessels are much thinner than the arteries. They are elastic, but do not remain round when empty. They contain valves (see Figs. 47 and 48), which allow the blood to pass upwards on its way to the heart, but it cannot return, as the valves sac, or bulge out. The veins have an uphill work to do, and this is done by muscle action, which is greatly assisted by the various movements we make. Thus it is we are in better health when taking proper exercise, as the functions of circulation are assisted and the blood is therefore more pure. If we hold the hands still for some time the veins become, as it were, knotted. Standing for a long period is very bad indeed; it can easily be realised how VARICOSE VEINS are brought about by this means. We want change of position, movement and rest to enable the walls of the veins to do their proper share of work.

The veins gradually collect in two vessels, the SUPERIOR VENA CAVA, which carries the impure blood from the head and arms, and the INFERIOR VENA CAVA that from the lower limbs. These two, as we stated at the commencement of this chapter, return the blood to the right auricle of the heart for purification.

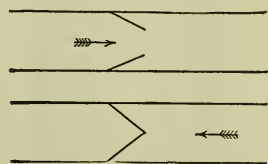


FIG. 47.—DIAGRAM OF VALVES
IN VEINS.

THE CAPILLARIES.—The capillaries are the vessels that carry the blood from the arteries to the veins (see Fig. 49). They are innumerable throughout the system. See how soon blood comes from the

slightest prick with a pin. Any puncture, piercing the dermis, or true skin, will produce blood. A portion of a capillary is so thin that it is by this means that the blood feeds the system through its walls. There are cells here that take all the nourishment the fresh food contains, and in return make a handsome payment by giving them the rubbish, that is, the CARBONIC acid gas and other waste not employed by LYMPHATICS. This is passed back by the capillaries to the veins, and so to the heart.

We have now given a rough outline of the circulation of the blood, the capillaries completing the circle. The ancients had no knowledge of the capillaries; they imagined that the blood simply soaked from the arteries into the body.

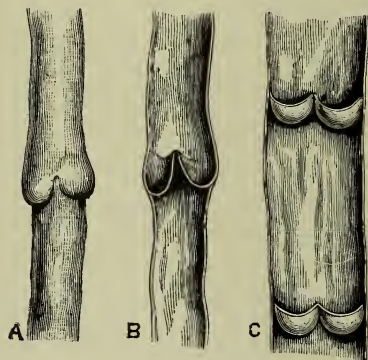


FIG. 48.—VEIN VALVES.

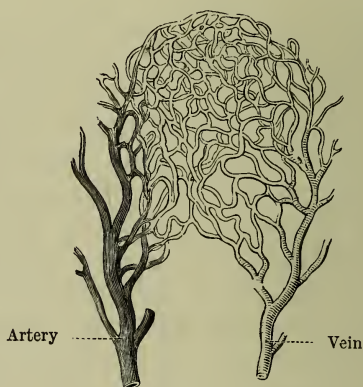


FIG. 49.—THE CAPILLARIES.

CHAPTER IV.

HÆMORRHAGE, OR BLEEDING.

HÆMORRHAGE is a word derived from the Greek, and expresses "flowing of blood."

In the last chapter we dealt with the circulation of the blood, and in this it is our intention, as far as possible, to give brief directions as to the best means to adopt in the case of a rupture of any vessel connected with the grand scheme of circulation.

The flow of blood may result either from a wounded artery, vein, or capillary, and in order that we may be able to deal effectually and quickly with any hæmorrhage, we must first of all know how to distinguish whether the blood is issuing from an artery, vein or capillary. Hæmorrhage from an artery is termed

ARTERIAL BLEEDING.—The blood here is of a *bright red colour*, and is pumped out in jerks, which is caused by the pulsation of the heart. Arterial bleeding is the *most important and dangerous hæmorrhage* with which we have to deal.

Next in importance is bleeding from a vein, which is called

VENOUS BLEEDING.—The blood in the veins is of a *dark purple colour*, and flows steadily from a wound.

CAPILLARY BLEEDING.—We are all, more or less, acquainted with this form of hæmorrhage. We have only to cut a finger, and we see blood oozing out of all parts of the wound. In the last chapter we explained that blood in the arteries was fresh from the heart, and therefore newly charged with oxygen, hence its bright red colour; also that the blood in the veins was impure and charged with carbonic acid gas—to which its dark colour is attributable.

There are THREE VERY IMPORTANT POINTS which we must lay to heart in connection with hæmorrhage:—

1. The blood in the arteries is passing from the heart to the extremities: therefore BLEEDING MUST BE STOPPED ON THE SIDE OF THE WOUND NEAREST THE HEART.

2. The blood in the veins is returning from the extremities to the

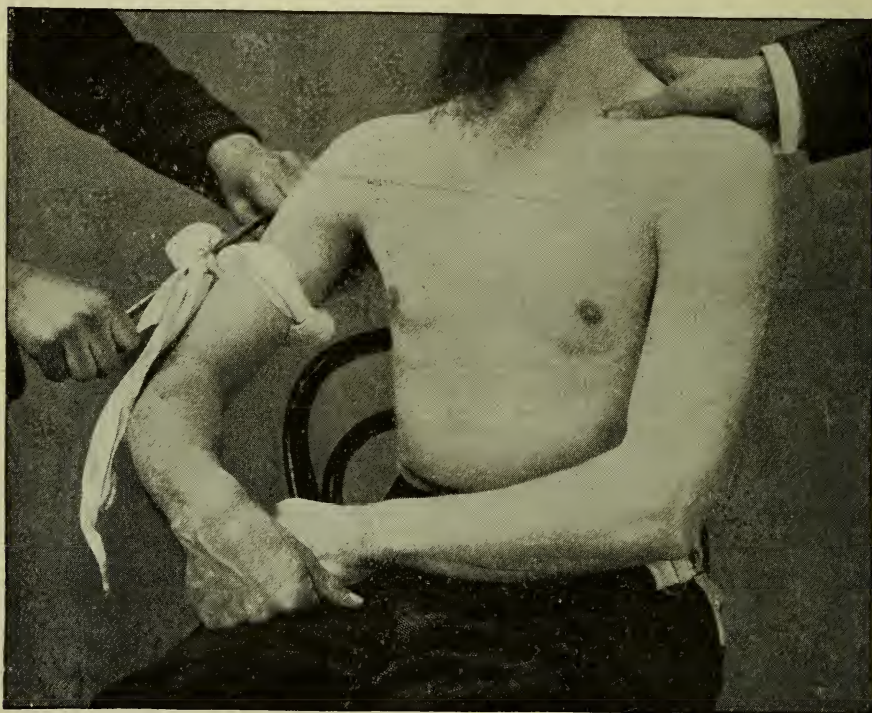


FIG. 50.—TOURNIQUET APPLIED TO THE BRACHIAL ARTERY.

FIG. 51.—DIGITAL PRESSURE ON THE SUB-CLAVIAN ARTERY.

heart, and so BLEEDING MUST BE STOPPED BY PRESSURE IN THE WOUND ITSELF, AND ON THE SIDE FURTHEST FROM THE HEART.

3. Do NOT GIVE STIMULANTS. If this is done the heart will beat faster, and there will be a greater flow of blood.

CAPILLARY BLEEDING.—This is exemplified in a cut when shaving, a scratch or any small wound. Exposure to the air is sometimes sufficient to arrest the bleeding; if not, pressure will usually stay the same; it may,

however, be necessary to aid in the coagulation of the blood, and to do this we have to apply a Styptic (a substance having the power to arrest bleeding). The chief styptics are cold, tannin, alum, and collodion.

Soak some lint or a handkerchief in HOT WATER, and place it on the wound (as hot as the patient can bear it), applying at the same time pressure to the part. Renew the hot cloths. COLD WATER can be used in the same manner. Turpentine or common salt may also be applied. To let cold water run from a tap on to the wound is also very effective.

If the bleeding should be from a wound in a limb, raise the limb: blood, like any other liquid, cannot run up a tube, which it will have to do if you raise, say, an arm or a leg. It will depend entirely on the pumping of the left ventricle of the heart as to the blood being forced to a wound when the limb is raised.

VENOUS BLEEDING.—Remember that blood from a wounded vein is of a dark purple colour. If the hæmorrhage is from a vein in a limb, at once raise it, and the bleeding will probably cease.

Digital pressure may be used; by this we mean that the thumb or finger may be pressed on to a small wound, whilst an assistant is making a firm pad. Lint is of course the best material for this purpose, but any clean white substance may be used. Then fold a NARROW triangular bandage and with the same secure the pad firmly on to the wound.

If it is a large vessel that is bleeding, we may find it necessary to apply pressure by another bandage and pad on that side of the wound that is farthest from the heart. It must be tied tightly, or it may be necessary to screw it up (a tourniquet) as directed for arterial bleeding. This will probably have to be done in the case of severe bleeding from a burst varicose vein. In all cases of excessive venous bleeding anything that will hinder the return of the blood to the heart must be removed; as, for instance, in the case of bleeding from a varicose vein in the leg, garters or straps must be loosened.

ARTERIAL BLEEDING.—We now approach the most important class of hæmorrhage with which a First-aider has to deal—that proceeding from the arteries. Remember, we can always discern this form of bleeding by the blood being jerked out of the wound, and by its bright red colour.

WE MUST ACT VERY PROMPTLY.

If a large artery is cut, the person may bleed to death in a few minutes, therefore SECONDS ARE VALUABLE. Do not stay to get material with which to bandage the wound or to make a tourniquet, as described below, but proceed at once to use DIGITAL PRESSURE between the wound and the heart at the point which is nearest the wound where the artery may be pressed on to a bone (*see Fig. 46*). Once having arrested the bleeding, we must direct anyone standing by to act as we wish, that is, to obtain material with which a tourniquet may be made, or to proceed for medical aid. The digital pressure must not be released until a tourniquet has been made which will replace same. If the limb is elevated this will greatly diminish the flow of blood to the part.

Digital pressure on a pad made of lint or soft substance placed on the wound will be sufficient to stay the hæmorrhage from a small artery. This pressure may be released after a while, but the pad should be secured on to the wound by a narrowly-folded triangular bandage, or by a handkerchief.

In order that the course of the main arteries may be fully understood, a diagram is inserted in the last chapter (*see Fig. 46*), giving their positions and proximities to the bones. PRESSURE on an artery, either digital or by a tourniquet, is of *no use unless it is made directly on to the bone*. If we press, say, a sponge on another sponge, it will have very little effect; but if we press a sponge against a brick wall it will become flat; and so it is when we press an artery. We must always do so against a bone or it will be of very little service. The pressure on an artery against a bone will have the same effect upon it as would be the case if, supposing we were watering the garden with a hose, we happened to tread thereon. The flow of water would cease at once: so with the artery, the flow of blood is stopped if pressed against a bone.

THE PRESSURE ON AN ARTERY MUST BE MADE ON THE SIDE OF THE WOUND NEAREST THE HEART.

Do not forget this, or that the pressure must not be released until a doctor has arrived and has given such instructions; unless, indeed, medical aid cannot be obtained for a considerable time. Then a tourniquet must be used, but should not remain screwed up very tightly for a long period. If we fail to get medical assistance within, say, an hour, it is better to loosen the pressure gradually. The wound must, however, be watched the whole time, and tight pressure should be



FIG. 52.—ARRESTING BLEEDING IN THE FORE-ARM BY MEANS OF A PAD AT ELBOW-JOINT.

applied again if necessary. No one must attempt this process unless he can give his whole attention to the wound during the time the pressure is relaxed.

A person who has lost a large quantity of blood must be laid flat on the back, as the heart's action will be weak. In this way the supply of blood to the brain and nerves will be assisted.

When we have secured an artery with a tourniquet, the injured person may be conveyed to a doctor or hospital without fear of any further loss of blood.

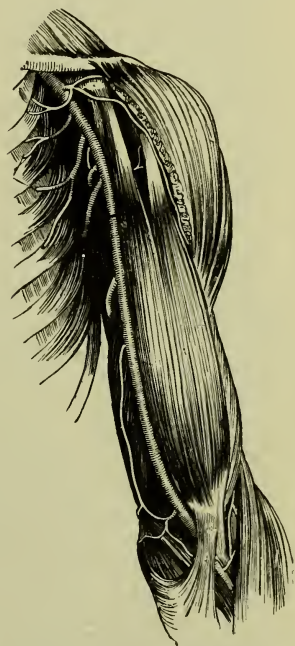


FIG. 53. —ARTERIES IN THE ARM.

TOURNIQUETS.—There are various kinds of tourniquets used in the medical profession, but a First-aidier is not likely to have any of these at hand, and therefore we will give a few particulars as to several ways of improvising tourniquets.

1. Obtain a piece of elastic web, about two inches wide and thirty inches long; bind the two ends to prevent fraying, and attach two tapes to one end for the purpose of tying the same. The method of using such a tourniquet is as follows:—Place the end of the elastic (without the tapes) on to the limb and hold it. Then, with the other hand, take the elastic round the limb, stretching it so that it will grasp the limb tightly. Having done this, take a tape one way and the other end in the opposite direction round the limb, and tie. A tourniquet of this pattern, firmly applied on the side of the wound nearest the heart, will arrest severe hæmorrhage. Elastic braces or a belt could be used for a tourniquet in the same way. **ELASTIC TOURNIQUETS MUST NOT BE APPLIED TOO TIGHTLY** or we shall permanently injure the capillary circulation beneath.

2. A piece of elastic tubing wound round the limb tightly and secured, makes a good tourniquet.

3. Fold a **NARROW** triangular bandage, then get a stone, cork, or any hard substance, and tie the same up in the middle of the folded bandage. Apply this hard knot to the point nearest the wound on the heart side, where the artery may be pressed against a bone. Pass the two ends of

the bandage round the limb and tie loosely in a reef knot. Pass a stick, ruler, or something of this kind through the same on the opposite side of the limb to that on which pressure must be made, screw the stick round (*see* Fig. 50) and then the hard knot will press the artery flat on the bone beneath and stop the bleeding. When the tourniquet is screwed up, it is best to put a piece of cardboard or some substitute, on which to screw the bandage; if this is not done it will create pain by pinching the flesh when screwing the bandage round the limb—even when clothed. If the bandage is thick a knot tied in it without the stone will be sufficient. Failing a bandage, a good sized handkerchief, or even a necktie or scarf, with a stone or something hard inserted, will answer the purpose if placed in the proper position on the limb and screwed up as directed.

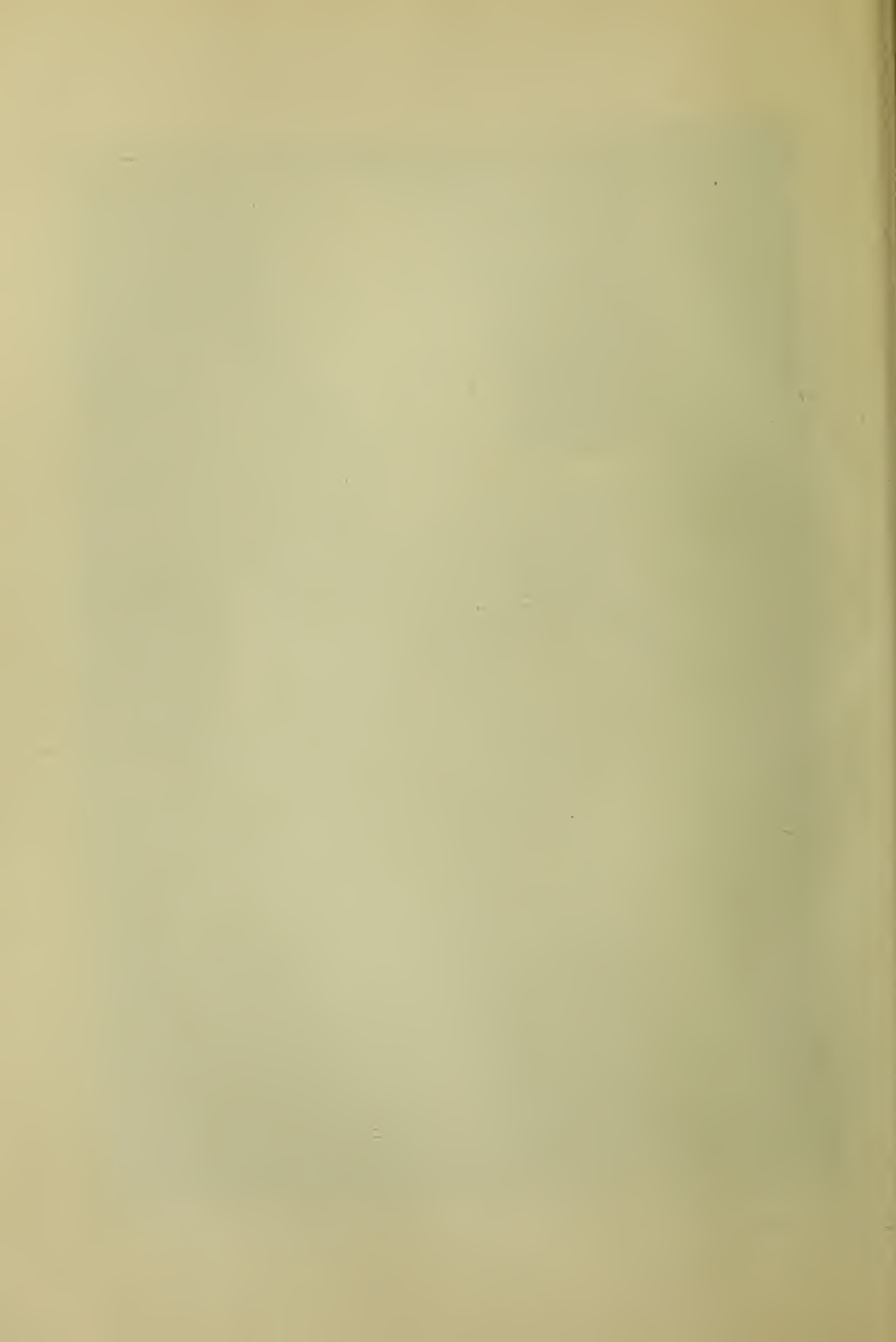
COMPRESSION OF THE ARTERIES.

HEAD.—Bleeding from any part of the head may be dealt with effectually by pressure on the wound, as the skull is just beneath, and the vessel consequently must be compressed. If, however, the hæmorrhage is severe, press the TEMPORAL artery against the temporal bone with the fingers, or by putting a pad and securing it with a bandage (*see* Fig. 72). We may feel the artery beating just in front of the opening to the ear: put pressure there with the finger. Again, the FACIAL artery may be felt pulsating on the lower jaw between the ear and the chin, rather nearer the ear. Pressure may be applied here, or if the cheek is injured severely, press the artery by inserting a finger in the mouth and with it squeezing the cheek against the thumb on the exterior. We may squeeze the lips in the same way if they should bleed. As a rule it will be found that this will arrest the hæmorrhage.

NECK.—*The Carotid Artery.*—This is the artery that is injured in the case of a cut throat. In the last chapter we spoke of the right and left carotid arteries in the neck, which lie just in front of the large muscles on each side of the neck. A person attempting to take his life in this way seldom does more than cut the artery on one side, and usually it is the left carotid artery that is severed or injured. We can only use DIGITAL pressure in a case of this kind. At once plug the wound with the thumb or fingers, and then put pressure with the other thumb on the carotid artery, and the fingers of that hand on the back of the neck. The pressure with the thumb must be made in a line



FIG. 54.—DIGITAL COMPRESSION OF THE FEMORAL ARTERY.
100



that will force the artery against the spine. We must be careful not to press the windpipe as this would suffocate the patient. ON NO ACCOUNT PUT A TOURNIQUET ROUND THE NECK; THIS WOULD STRANGLE THE PATIENT.

Shoulder, Armpit, and top of the Arm.—Use digital pressure with the thumb on the SUB-CLAVIAN artery behind the middle of the collar-bone, or Clavicle (*see* Fig. 51), pressing the artery down on to the first rib. In thin persons this is easy, but with stout persons we may find some difficulty, therefore it will be well to bind the handle of a door-key with something soft and push this down. If the wound is in the armpit, make a pad and push it firmly into the armpit where it will compress the AXILLARY artery. The arm must then be tied to the side. Should we, however, have to deal with a severe case of hæmorrhage in the upper part of the arm (shoulder), the quickest and safest method is to compress the sub-clavian on the rib as above.

ARM.—If the wound is in the elbow or on the arm near it, the best means to adopt is either to use digital pressure or apply a tourniquet, so as to compress the BRACHIAL artery against the arm-bone (humerus). The course of this artery from the armpit to the elbow (*see* Fig. 52) almost follows the line made by the inner seam of the coat-sleeve, when we hold the arm out with the palm uppermost. It is in the groove behind the BICEPS muscle. Digital pressure on this artery may be made with the thumb or fingers. It is easier to do so with the fingers, as we get a more extended range of operation. If we use the thumb, the fingers must be in a direct line on the opposite side of the bone, and *vice-versâ*. If we use the fingers we must not press them edgeways, but APPLY GENTLE, FIRM PRESSURE WITH THE BALLS OF THE FINGERS. The knotted bandage, or handkerchief tourniquet, may be prepared under direction, but we must not release our grip on the artery until it is ready as a substitute and placed ready for winding up with a stick or something of that kind (*see* Fig. 50). If we use a stick, one end or both must be secured; otherwise we shall have to hold it. Tourniquets made of wide elastic band or elastic tubing may be stretched round the limb and secured; this will answer the same purpose.

FOREARM.—Bleeding from the RADIAL or ULNAR arteries in the forearm may be stayed by putting a pad in the elbow and bending

the forearm to the arm. and fixing it with a bandage (*see* Fig. 53), or else by digital pressure, or tourniquet on the brachial artery (*see* Fig. 50).

THE HAND.—Injuries to the hand are common, the most severe being, as a rule, the result of accidents with glass bottles. The artery in the hand is termed the PALMAR ARCH. This may be compressed by making a pad, somewhat conical if possible, so that it will sink well



FIG. 55.—COMPRESSION OF ARTERY AT THE GROIN BY TYING THIGH TO BODY.

into the hollow of the palm, then bend the fingers over same. Fold a NARROW triangular bandage and with the same fix the closed hand tightly to the pad. This is best done by putting the centre of the folded bandage over the knuckles, bringing one end down the back of the wrist and the other down the front of it. Draw these ends tightly down; pass the bandage upon itself round the wrist in opposite directions, and tie securely. The arm should then be placed in a large arm-sling.



FIG. 56.—“THE SPANISH WINDLASS” TOURNIQUET TO FEMORAL ARTERY.

THE THIGH.—The course this artery—the Femoral—takes is traced as follows:—We can feel its pulsation in the centre of the groin; and if we take a line down the limb gradually, going round under the knee on the inside, this will mark its position. It is deeply seated here, and if we use digital pressure it will require the use of both thumbs, one pressing the other (*see* Fig. 54). If the wound is low down in the thigh another method is to tie the thigh to the abdomen (*see* Fig. 55). If we improvise a tourniquet with a triangular bandage, to be placed on the femoral artery, we must see that it has either a good-sized knot or stone tied up in the centre of the bandage. Digital pressure must not be released until the tourniquet is made, placed in position, and tied round the limb. The tourniquet must be screwed up with a stick, or something suitable, and then fixed to prevent it relaxing its grip (*see* Fig. 56). This form of tourniquet is sometimes called “The Spanish Windlass.” We must always remember that PRESSURE upon arteries for the purpose of arresting hæmorrhage from the wound MUST BE MADE BETWEEN THE HEART AND THE WOUND, as the blood supply comes from the heart.

KNEE.—The artery at the back of the knee-joint is termed the **POPLITEAL** artery. Bleeding from a wound here may be stayed by placing a firm pad in the bend of the knee (Popliteal space) (*see* Fig. 57), and then tying the leg to the thigh. Another method is by compression—either digital or with a tourniquet—on the Femoral artery.

LEG.—The artery divides into two under the knee (Popliteal space), and becomes the **ANTERIOR TIBIAL** and the **POSTERIOR TIBIAL**. The one is somewhat to the front, and the other to the back of the shin bone (**TIBIA**). Bleeding from these arteries is best arrested by placing a pad in the Popliteal space behind the knee, and then tying the leg to the thigh, or by compressing the Femoral artery with digital pressure or a tourniquet.

FOOT.—The Anterior Tibial artery passes from the leg to the instep, and the Posterior Tibial artery goes to the sole of the foot, and forms an arch (the **PLANTAR ARCH**) for the supply of blood to the toes.

The Posterior Tibial artery may be felt at the back of the ankle-bone on the inside of the foot. For a small wound a pad may be fixed here, with a bandage, which will be sufficient to arrest bleeding. If bleeding from the sole of the foot is severe we must resort to the pad behind the knee, and bandage the leg to the thigh, or compress the Femoral artery by digital pressure or with a tourniquet.

At any time when using digital pressure try and compress only the vessel that is bleeding; do as little injury as possible to surrounding parts; bear in mind, our duty is to prevent further injury, not to create more.

There is another kind of hæmorrhage for which we may be called upon to render First Aid, and that is

INTERNAL HÆMORRHAGE.

In cases of this kind a First-aider cannot render any great assistance. Medical advice must be sought AT ONCE, as some of the organs of the body may be seriously affected and life be at stake. The bleeding may come from the lungs (Hæmoptysis), and when this is so the person is said to "spit blood." It is bright red in colour, and frothy, owing to air being mixed with it.

The patient and friends will naturally be alarmed, but we must do all we can to keep them quiet and calm. Try to reassure the patient; this will help materially. If we can obtain ice, give it to the patient to suck, or a little vinegar and water; either of these will aid in forming a "clot." Anything used for clotting the blood is commonly called an astringent, or styptic (something which binds). Strong COLD tea may be given to sip, or alum and water; these have the same effect. NEVER GIVE A STIMULANT IN SUCH A CASE, for if this is done it will aid the heart's action, and its force will be greater, and the blood in consequence flow more freely. Remember, OUR duty is to *arrest* bleeding, not to encourage it. Bystanders and friends will probably try to induce us to give brandy, and perhaps will be annoyed that we do not heed them; we must be very firm, as a stimulant MIGHT CAUSE A FATAL RESULT. The loss of blood may make the patient very faint and white, but still—do not allow spirits to be given. The doctor may grant its use, but we should not administer it without his sanction.

Put the patient in a recumbent position on a sofa or bed in a darkened room, with the head slightly raised; apply smelling salts to

the nostrils, and impress on all present to be quiet. If any nourishment is given IT MUST BE COLD; but if extremities of the limbs are cold, which probably will be the case, owing to shock, which



FIG. 57.—COMPRESSION OF POPLITEAL ARTERY BY PAD.

accompanies severe internal bleeding, warmth may be applied by means of hot-water bottles wrapped in flannel.

Should we have to deal with a case of *bleeding from the stomach* (Hæmatemesis), we can recognise it because the blood in this case is generally dark and not frothy, as in the case of bleeding from the lungs. The patient would most probably complain, previously, of

an uncomfortable feeling or pain in the stomach, and would suddenly vomit a quantity of blood.

All that we can do in such a case as this is to treat it in the same way as described in hæmorrhage from the lungs. There would be the same alarm, and we must render our aid quietly, and remember to do all we can to reassure the patient, meanwhile sending for medical aid without any delay. Food must not be given except under the doctor's orders.

Internal hæmorrhage may be caused by some disease of an organ of the body, or it may be occasioned by a stab or wound.

If the patient should show signs of collapse, and become unconscious, he would then be said to be in a state of Syncope. Any support to the head must be removed, and the patient packed in warm blankets, and warm water bottles must be placed round him. Should the hæmorrhage be stopped, and the patient rally and be able to swallow, we may give him warm (not hot) tea or coffee.

BLEEDING FROM THE NOSE (EPISTAXIS).—It is only when hæmorrhage of this kind is very excessive that there is any reason for alarm. Sometimes the head feels clearer after a little nose-bleeding. It is often, however, very troublesome, and will occur at most inconvenient times.

NEVER HOLD THE HEAD OVER A BASIN when the nose is bleeding. Quite recently the writer found a friend who had swooned away, owing to the loss of blood occasioned by his acting in this way. Sit down erect, holding the head a little back. The old household remedies and methods of applying cold to the back of the neck are generally sufficient to check the hæmorrhage. As, for instance, a cold key, ice, or wet cloths. Vinegar and water, or alum and water (made weak), are good astringents, and should be sniffed up the nostrils. The clothing at the neck is best loosened.

If this treatment is not effective, the nostrils must be plugged with lint, if at hand, or any clean, soft, white material. This pad, or plug, must be firm. Cotton-wool should not be inserted loosely, but packed tightly in a small piece of linen it will make a good plug. When the nose is plugged the blood sometimes gets into the throat. Should this happen the patient will cough it up and become alarmed, thinking at once he has some serious lung trouble. Under such circumstances we have to make the reason for coughing up blood clear to the sufferer.

There are a certain number of persons who have a tendency to bleed very freely, with little provocation. The blood lacks in coagulating power, and hence even a trivial wound will cause them much annoyance. Persons suffering in this way are known as "bleeders." They should be careful to warn a dentist, if they have need to consult him; because he must be prepared, in their case, to use styptics. In a case of this kind a First-aider would apply the means given in this chapter for arresting hæmorrhage.

BLEEDING AFTER TOOTH EXTRACTION.—This is often very troublesome, but there is no danger. If severe, the best plan will be to pack the cavity *tightly* with some cotton-wool which has been dipped in turpentine, or a solution of carbolic acid (weak), or alum. In order to keep this packing wedged in, it may be necessary to *tightly* fill the aperture made between the teeth by the extraction of the tooth with the same dressing, so that when the jaws are closed the opposite jaw will be the means of still further compressing the packing into the cavity. The triangular bandage for the jaw (*see* Fig. 76), or the four-tailed bandage (Fig. 100), may be applied to keep the jaws together. Of course this treatment is only to be used when we fail to stop the bleeding, and when it has been going on for some time.

CHAPTER V.

WOUNDS.

THERE are four principal classes of wounds, which may be enumerated as follows:—

1. INCISED: which means *a clean cut wound*.
2. PUNCTURED: one caused by *a stab* with a sharp instrument.
3. LACERATED: a *torn*, jagged edged wound.
4. CONTUSED: a *crushed* wound, with much bruising of the part.

GUNSHOT wounds may be put down as another class of wounds, as they can scarcely be placed under any of the above four headings.

IF THE HÆMORRHAGE BE SEVERE, IT MUST BE ARRESTED BEFORE WE PROCEED TO THE DRESSING OF THE WOUND.

Within the last few years the treatment of wounds may be said to have changed. This is due to the putrefaction (process of rotting) which was so common, having been attributed to germ life. Now, therefore, the treatment adopted is by means of antiseptic or disinfectant dressings.

In order that a wound may progress favourably, and keep a healthy appearance, we must insist on extreme cleanliness. Our hands must be perfectly clean when dressing a wound, and nothing in any way soiled should be used. Dusty plaster or material must be avoided.

Wounds vary very much; it may be only an abrasion of the skin, or almost the severing of a limb. With severe wounds there is shock, which is an affection of the nervous system, which interferes with the heart's action, and this in some cases is very serious. The patient will be noticed to shiver, the face will be pallid, the breathing and pulse will be feeble, indeed there will be a general sign of collapse. In a case of shock, we must at once apply heat to bring about a reaction. Put

the patient to bed, between blankets, give small doses of sal volatile in water and apply hot water bottles, or hot bricks wrapped up, to the extremities and round the body. Warm tea or coffee may be given if the patient can swallow.

INCISED WOUNDS are produced by a cutting instrument, such as a razor or sharp knife, and the wound will gape open. Hæmorrhage



FIG. 58.—EDGES OF A WOUND DRAWN TOGETHER BY PLASTER.

having been stopped, we must cleanse the wound and if it looks serious, apply a dressing; if not the edges should be drawn together with plaster (*see* Fig. 58). This illustration shows how to cut and use two pieces of plaster for this purpose. Thread one piece through the aperture in the other, and having done this, the end of one piece can be placed on either side of the wound, and the end of the other piece on the opposite side. Then gently draw the sides of the wound into contact, and fix the other ends of the plaster as shown in the Figure.

A cut throat would come under the heading "Incised Wounds,"

because it is a clean cut and will gape open. If the windpipe is penetrated, we must prevent blood getting into it by wiping it away, but on no account plug the windpipe. Breathing will be heard going on through the aperture.

DRESSINGS.

The most simple and handy form of dressing for a wound is a handkerchief folded as a pad and soaked with cold water; this may be fastened on a wound with another handkerchief. If, however, we can obtain a piece of lint, we should soak it in cold water, and put some oil-silk, gutta-percha tissue, or a substitute over the lint to keep it moist. If we cannot get anything of the nature of oil-silk a piece of white paper may be oiled and used. Should we only have linen, it is better to put some cotton-wool on this as padding, but not next to the wound.

ANTISEPTIC DRESSINGS.

These are substances which prevent or retard decomposition.

If carbolised wool can be obtained this should be used for cleansing the wound, and antiseptic lint would be better for the cold-water pad. Plain lint, or linen soaked in turpentine, whisky, or a fluid made of crystals of permanganate of potash, or else vinegar or common salt in warm water may be used as antiseptic dressings. A weak solution of carbolic acid, say one part in forty of water, may also be used, but care must be taken not to exceed this strength or we shall do far more harm than good. Boric acid solution is a less dangerous remedy. Carbolised tar is another useful dressing for wounds. It is a bad plan to use a sponge for washing wounds. We can never be certain as to what a sponge may or may not contain. It is possible that germ-life may be existing or clinging therein which might prove very harmful to a wound. The best plan is to make some pads with antiseptic wool or cotton-wool, tied in a piece of clean soft white material. **THESE SHOULD BE BURNT AFTER USING.**

The smooth side or back of lint should be placed next to a wound. **NOT THE WOOLLY SIDE.**

PUNCTURED WOUNDS.—Punctured wounds are caused, as we stated, by a stab. A needle or pin penetrating the flesh would cause a small

puncture, but the more serious and larger wound would be such as a bayonet puncture. We cannot readily perceive what vessels have been injured, especially if the wound be deep. There is usually severe pain with a deep wound, and this may be alleviated by a poultice. In any case we must wash the wound and put on an antiseptic dressing.

LACERATED WOUNDS.—Such injuries are usually met with in towns, where there are large works and machinery. The wound will have the appearance of having been torn, and there will not be much hæmorrhage. A severe wound of this nature often means amputation of the limb. In any case, during the healing process, which usually takes a long period, there will be a discharge of pus. Therefore at the time of the accident the sooner we can cleanse and dress the wound with an antiseptic, the less serious the mischief will be. Having cleansed and dressed this gently and thoroughly we must see that the damaged part has complete rest.

CONTUSED WOUNDS.—A wound of this nature is usually the result of a heavy blow. There will be a great deal of bruising, which is due to the crushing of the capillaries. When healing, the bluish-black bruise will go through the various shades of colour noticeable with all bruises. We must therefore apply pressure with a pad of soft material to the part in order to stop the hæmorrhage from the capillaries. Raise the limb and place it at rest. In the case of an arm, in order to give it complete rest, it may require splints and bandages, and also a sling. In any case it will need a suitable arm-sling. In the same way the leg may require splints; if not the patient must be placed in a recumbent position with the leg raised.

GUNSHOT WOUNDS.—A patient who has received wounds of this kind will most probably suffer in addition from shock. This must be treated at once, as directed in Chapter XII. No attempt must be made to extract any shots or bullets. The aid we can render is to arrest hæmorrhage and apply an antiseptic dressing to the part. The bone in the region of the injury may be splintered or even fractured. If

there seems to be any possibility of fracture, the limb should be placed in splints and treated in every way as a fracture.

Frequently gunshot wounds are the result of playing with firearms, and sometimes through leaving them about where young children can get hold of them. Remember, it is part of a good First-aid-er's duty to assist in putting a stop to such practices. This is truly an example of First Aid.

POISONED WOUNDS.—Wounds of this nature may be caused by injuries from a rusty or dirty instrument, and if such injuries do not receive immediate antiseptic treatment there will soon be severe inflammation, or reddening of the part, accompanied by much pain. Everyone knows what it is to have a "gathering," or a whitlow; matter is formed and there is a sharp darting pain.

What we have to prevent is the setting in of erysipelas, as this is dangerous, and not only dangerous, but very infectious. A patient with this disease must be isolated from all others. When we find a wound has been caused by anything likely to poison the part we must *at once* apply an antiseptic dressing and seek medical aid immediately.

As bites of snakes, rabid, and other animals, stings, etc., are really poisoned wounds, we will proceed to give directions as to the First-aid treatment necessary.

SNAKE BITES.—Fortunately in this country snake bites are rare, as we have only one poisonous snake—the Black Adder, or Viper, as it is sometimes called. If we should happen to be present when a snake bite occurs, remember the action of the poison is very rapid, and the quickest remedy is to suck the wound and spit the poison out. This may be done with perfect safety, if we have no cracks or wounds in our lips or mouth. If we are afraid to do this, and it is a limb that is injured, we should hurriedly make a ligature with a handkerchief, and tie it *tightly* round the limb on the side of the wound nearest the heart, or a tourniquet may be applied to the artery at the nearest point of pressure, between the wound and the heart, in order to prevent the poison circulating in the system. Apply any of the antiseptic dressings named in this chapter to the wound, and give the patient frequent doses of brandy, whisky, or a teaspoonful of

sol-volatile diluted. Do not use caustic, or burn the wound, if medical aid can be summoned and obtained at once. If, however, there is no chance of obtaining the services of a doctor, we must in a severe case burn the wound. If in the open, gunpowder may be placed all over the wound and fired, and this should be repeated several times. Fusee matches will do, failing caustic or gunpowder.

DOG BITES. (Healthy or rabid.)—If there is a chance of the dog being in an unhealthy state when it bites a person, it is best to treat the bite in the same way we would a snake's bite. Of course we must, first of all, put on a tourniquet near the wound on the side nearest the heart, and then treat the wound as directed for snake bite. If the bite is inflicted through the clothing there is much less risk, as the clothing would cleanse the teeth of all, or at least some, of the poison. People worry themselves into all kinds of ideas; some even think if they are bitten by a healthy dog, that if the dog is not killed at once it will be serious; while others think that if the dog has rabies ten years hence they will naturally have hydrophobia. People who have dogs should keep a very sharp look-out when their dogs are bitten by another dog; anything strange in their attitude should be noted and reported to all who are concerned. Dress any wound that the dog may have received with an antiseptic dressing, and wash the part well with a solution of permanganate of potash.

STINGS.—The sting of a wasp or bee is painful, but not dangerous, unless we get a number of stings, which we may soon obtain if near a hive when the process of swarming the bees is going on. If we should be stung, several bees will scent it, and they will follow suit, and then the result may be serious. It is always best to hurry away when we have received a sting. If one of these insects should sting a person on the tongue or throat, which may happen, for they are sometimes hidden away in fruit, there is a danger of suffocation, as a large swelling will be produced. If the sting can be seen, place a watch-key over it and press it; this will force the sting upwards and probably out. Dress the part affected with ammonia or sal-volatile. Then there are the old-fashioned remedies of applying the blue-bag, cutting an onion and rubbing the part, or rubbing with salt. If stung in the mouth, use salt and water, or suck some raw onion.

Sal-volatile may be given. Obtain medical advice at once if stung in the throat. Whilst waiting, relief may be afforded by adopting one or other of the above remedies. A bee can only sting once, and this causes its death; hence a bee needs a lot of irritation before it will sting. A wasp can sting without injury to itself.

CHAPTER VI.

BANDAGING.

THE term "bandage" is from the French "BANDE," and denotes an article used for securing an injury, or binding it up. To be able to bandage well is one of the most essential points in the training of First-aiders. Devoid of this knowledge a person wishing to render "First Aid to the Injured" would be of very little service, and therefore we hope to give in these chapters such particulars as will enable those who cannot attend a course of instruction, to learn the methods adopted, and to become efficient in this branch of the work. Bandages are useful not only for binding up injuries, for protection from dust and heat; but also for supports and slings, for fixing splints to fractures, for keeping dressings in position, preventing muscular action (which in many cases furthers injury) and as tourniquets for arresting bleeding.

There are two principal kinds of bandages, TRIANGULAR and ROLLER. The Triangular bandage was introduced by Professor Esmarch of Kiel for use in the German army. Although bearing his name, "Esmarch Bandage," they were really invented by Mr. Mayor, a Swiss surgeon, who called them "handkerchief bandages." Many people term them "scarf bandages." Professor Esmarch was the first to suggest figures of illustrations on the material. The St. John Ambulance Association has adopted an illustrated triangular bandage with figures showing at a glance the various methods taught in their numerous classes. Dr. Beatson has also prepared one with special diagrams for the use of the classes under the auspices of the St. Andrew's Ambulance Association. For practice in the home, we give particulars as to the making of triangular bandages.

TRIANGULAR BANDAGING.

Take a piece of calico, three feet square (*see* Fig. 59), fold the corner A over to the corner D, and then cut the calico at the fold B C. We have

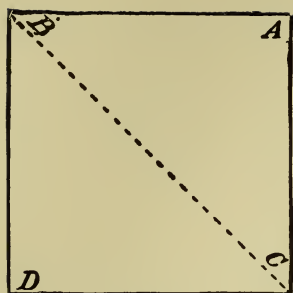


Fig. 59.

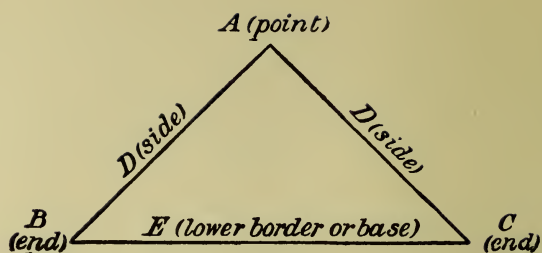


Fig. 60.

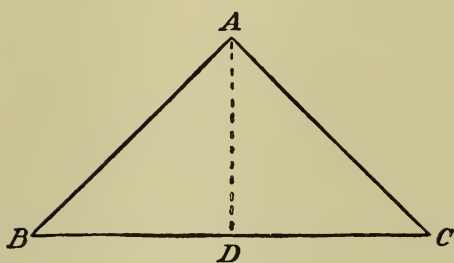


Fig. 61.

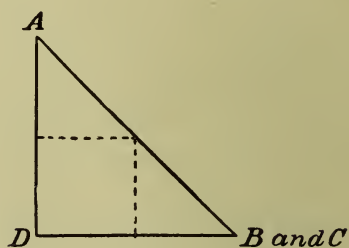


Fig. 62.

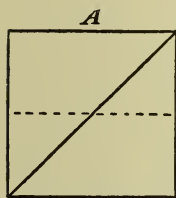


Fig. 63.

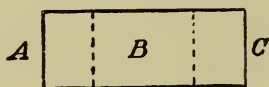


Fig. 64.



Fig. 65.

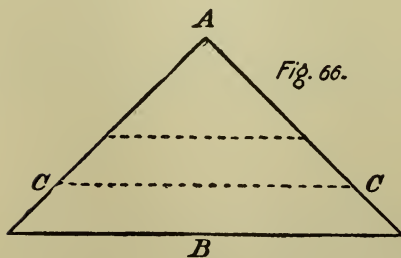


Fig. 66.

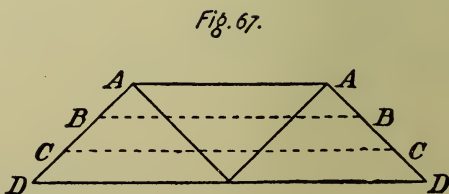


Fig. 67.

now two triangular bandages suitable for adults. For children a piece of calico two feet square cut in halves in a similar way, can be more neatly used, and will be of better service, as the larger one is difficult to apply to small limbs; and, not only so, but it is not advisable to burden an injury with unnecessary weight or warmth.

When bandaging we must be very exact and careful from the first as to the manner in which we fold or put on a bandage; neatness is most desirable, the layers of material should have as little creasing as possible and we must avoid twisting. Once neglect these precautions, and we shall find it is very difficult to break the bad habit, and the patient suffers in consequence; if we engage in this good and useful work, let us at least do it as well as we possibly can.

The material is, generally, unbleached calico, but flannel or linen is sometimes used. It often happens that bandages have to be improvised, and then a good sized pocket-handkerchief, or neck cravat, folded from corner to corner, diagonally, will serve the purpose. Failing this, and with nothing else at hand, a portion of the clothing on the patient may be made use of.

FOLDING BANDAGES.—On the diagram (Fig. 60), A represents the point, B and C the ends, D the sides, and E the lower border or base of a triangular bandage.

The proper method of folding a bandage, when not in use, is as follows:—Take the end B (Fig. 61) over to the end C.

Take the point A (Fig. 62) over to D, and the ends B and C over to D.

Fold B (Fig. 63) over to A.

Fold A (Fig. 64) to B and C to B.

Fold A (Fig. 65) to B.

Two terms are used in triangular bandage-folding, namely, “broad” and “narrow.”

The triangular bandage may be used either (a) spread out, (b) folded broad, or (c) folded narrow.

To fold the bandage as we say "broad," bring the point A (Fig. 66), over to the lower border or base B, then fold again at the dotted line c.

To fold one "narrow," bring the point (as before) over to the lower border, then fold A (Fig. 67) over to the dotted line c, and afterwards from B over to D.

Having been adjusted, a bandage is secured by fastening with a pin



FIG. 68.—SMALL ARM SLING AND SHOULDER BANDAGE.

(a safety pin if possible), a few stitches, or by the reef knot which cannot slip, but yet is very easily untied. Bandages should be tied as near to the ends as is convenient.

THE REEF KNOT.—Great care should be exercised in tying a proper "reef" knot. So many people find a difficulty in doing this, that we

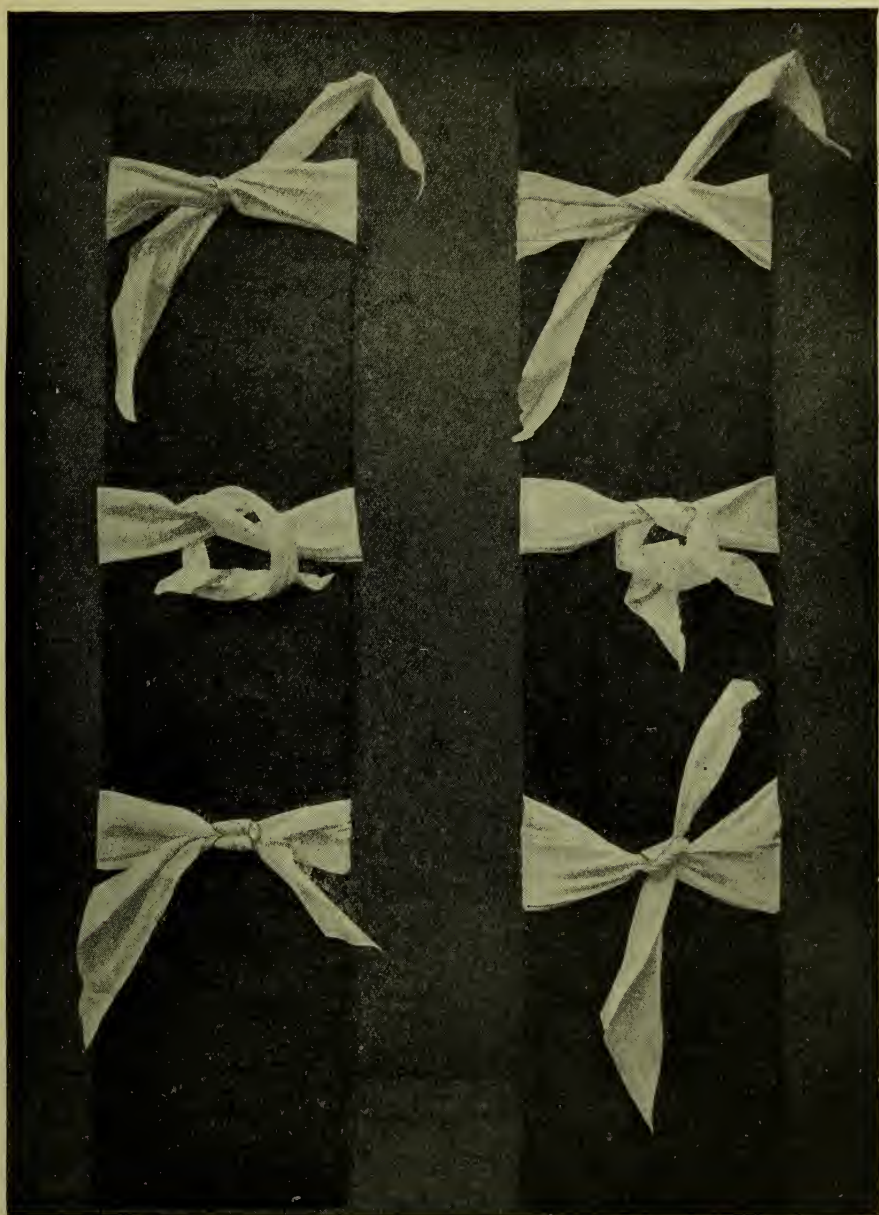


FIG. 69.—THE REEF KNOT.
(*Right.*)

FIG. 70.—THE GRANNY KNOT.
(*Wrong.*)



FIG. 71.—LARGE ARM SLING.

FIG. 72.—BANDAGE FOR JAW, OR FOR FIXING PAD ON TEMPORAL ARTERY



give illustrations of the knot, as it should be (Fig. 69), and the "granny" (Fig. 70), as it is termed when the knot is wrongly tied.

It will be noticed from the diagrams, that the first hitch is taken in the same manner in both cases. It is, however, different with the others. The end which is uppermost with the first hitch, when tying the "reef" knot, completes the half circle outside, or in front of the other end. The diagram shows how evenly the proper "reef" knot lies, with both ends downwards, when finished; but in the case of the "granny," the ends lie in different directions, and this is not only unsightly, but also insecure. There is another way of tying a knot which is more secure even than the "reef" knot. It is by taking a double turn when tying the first hitch, and then completing the process in the same manner as when tying the "reef" knot—this is termed the "surgeon's" knot. In ambulance work the "reef" knot is generally adopted.

THE LARGE ARM SLING.—To make this—spread out the bandage, and put one end over the sound shoulder; then place the point under the elbow of the injured arm; flex, or bend, the arm across the bandage and then put the other end over the shoulder on the injured side; pass it round the back of the neck, and tie in a "reef" knot on the opposite shoulder (*see* Fig. 71). Bring the extended point, lying behind the elbow, round to the front neatly, and secure the same with a safety pin, or a few stitches.

THE SMALL ARM SLING.—Having folded a "broad" bandage, put one end over the shoulder, on the sound side; flex, or bend, the arm and bring the sling round, taking in the wrist joint, and pass it over the shoulder on the injured side (*see* Fig. 68); then round the back of the neck, and tie in a reef knot on the sound side. Remember, in securing both the large and small arm slings, to tie knots OVER THE SOUND SHOULDER and not at the back of the neck; especially when a patient has to be carried in a lying-down position; knots are not pleasant things to lie upon. Extreme care should be taken to apply these slings with as few creases as possible, and after the knots have been tied, the ends must be tucked neatly away. Tidiness is most essential in ambulance, as in any other work.

THE SCALP OR HEAD BANDAGE.—Having spread out the bandage, fold the lower border, or base, over, making a hem about two inches wide; and, standing behind the patient, place the centre of this hem in a line with the nose, the fold being outwards, not next to the forehead,



FIG. 73.—SCALP OR HEAD BANDAGE (FRONT).

FIG. 74.—HAND BANDAGE (BACK).

meanwhile keeping it close down to the eyebrows (*see* Fig. 73) with the point of the bandage hanging loosely over the back of the neck. The two ends are then taken up and brought firmly round the head above the ears, and crossed over the point of the bandage, below the prominent (occipital) bone. This will prevent the bandage “riding up.” The ends

are now continued round to the front and tied in a reef knot over the nose (*see* Fig. 73); and what remains should be neatly tucked away. The point must be pulled down and brought upwards and over the back of the head, and pinned on the top (*see* Fig. 75). It should be



FIG. 75.—SCALP OR HEAD BANDAGE (BACK).

FIG. 76.—HAND BANDAGE (PALM).

firmly fixed and tested by taking hold of the back of the bandage below the occipital bone, and trying to remove it. This bandage is extremely useful for keeping poultices and dressings in position.

THE EYE BANDAGE.—Fold a “narrow” bandage. Place the centre

over the eye, and, passing it obliquely round the head (*see* Fig. 77), tie in a reef knot at the back, in a line with the eye.

THE LOWER JAW BANDAGE.—Fold a “narrow” bandage. Place the centre under and over the chin, and tie it well back at the top of the head (*see* Fig. 78), otherwise it will slip off. Or, better still, place the chin in a narrow bandage, as before, and taking the two ends upwards in front of the ears, pass one over the top of the head and twist it with the other (*see* Fig. 72), carrying one end round the forehead and the other round the back of the head, below the occipital bone, and knot them over the opposite temple.

THE SHOULDER BANDAGE.—After making a wide hem on the lower border, which must be kept outside, lay the point of the bandage well up the side of the neck. Gather up the two ends and pass them round the arm once or twice, to use up the bandage; tie on the outside (*see* Fig. 68). Fold another bandage “narrow,” flex, or bend, the arm, and put on a small arm sling; the end on the injured side crossing the point of the bandage on the injured shoulder. After the small arm sling is secured on the opposite shoulder, the point of the other bandage must be pulled down neatly and pinned (*see* Fig. 68). Sometimes, instead of putting on a small arm sling, the centre of a “narrow” bandage is laid over the point of the bandage on the injured shoulder, and one end brought across the chest and passed under the armpit; the other end being taken round the back to meet it, and then the two are tied. The point of the other bandage is then pulled down and pinned as described above.

UPPER ARM BANDAGE.—Fold the bandage “broad” and place the centre over the injury, carry the ends round the arm, cross them and bring them to the front and tie in a reef knot. Then flex, or bend, the arm and place the same in a small arm sling.

ELBOW BANDAGE.—Spread out a bandage and fold a wide hem. Place the elbow in the centre of the bandage, with the point of same



FIG. 77.—EYE BANDAGE.



FIG. 78.—JAW BANDAGE.

upwards on the back of the arm. Take up the two ends and cross them above the elbow on the inside, pass them round the upper-arm, securing the point, and then bring them round and tie on the inside. The point may then be brought down and pinned.

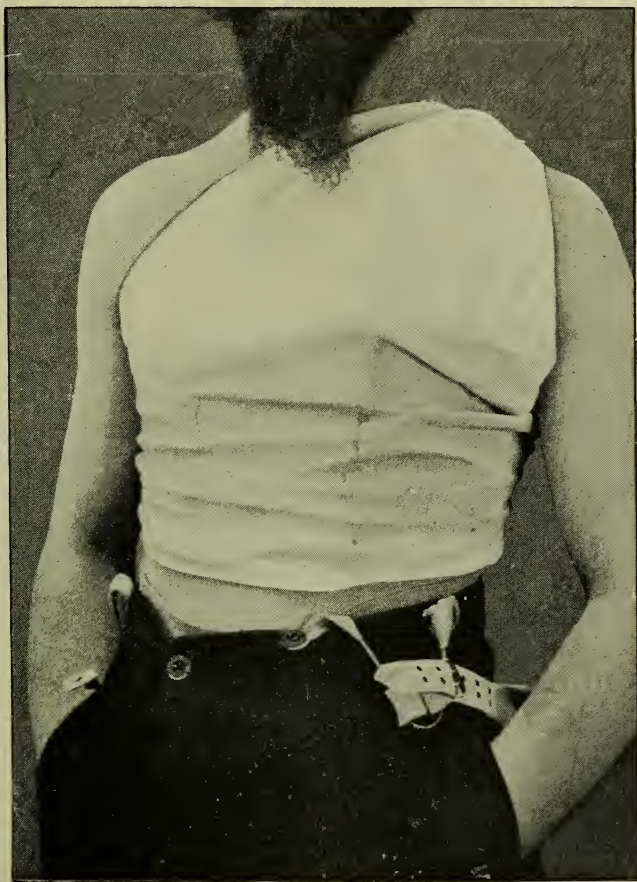


FIG. 79.—CHEST BANDAGE (FRONT).

FOREARM BANDAGE.—Fold and place bandage as for the upper arm. Then flex, or bend, the arm and place in a large arm sling.

HAND BANDAGE.—Spread the bandage out on a table or flat surface and place the wrist on base, or lower border, palm of hand downwards,

with the fingers towards the point. Bring the point over the fingers and back of hand and lay the point on the lower portion of the fore-arm. This done, gather up the ends; cross the ends neatly over the point, pass them round the wrist several times and tie on the

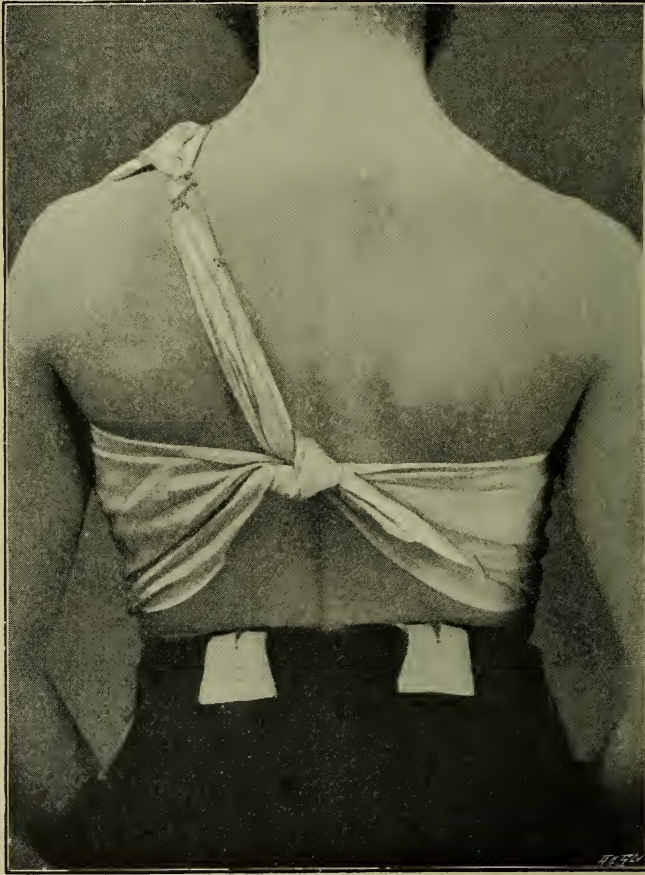


FIG 80.—CHEST BANDAGE (BACK).

back of the wrist (*see* Figs. 74 and 76). The point may then be brought down over the knot and pinned. Should the bandage be too large, a hem may be folded along the base, or lower border. After bandaging the hand, flex the arm and place it in a large arm sling.



FIG. 81.—HIP BANDAGE.



FIG. 82.--FOOT AND KNEE BANDAGE.

PALM OR BACK OF HAND BANDAGE.—Fold a “narrow” bandage and place the back of hand, or palm, as the case requires, on the centre of same. Carry the two ends round and cross them; then take them round the wrist twice and tie.

CHEST BANDAGE.—This is a most useful bandage, and will be found of great service in fixing or keeping poultices, etc., in position. Spread out the bandage, and place the point over the shoulder of the side on which it is required to fix the poultice or dressing. Then take the two ends round the body (*see* Fig. 79) and tie, leaving a long end which must be taken up and tied to the point lying over the shoulder (*see* Fig. 80).

THE BACK BANDAGE.—This is applied in the same manner as the chest bandage, with the exception that the knots are tied on the chest instead of on the back.

THE HIP BANDAGE.—Fold a “narrow” bandage, and place the centre over the hip which is to be treated. Pass the ends round the body, and tie them on the opposite side (a little to the front). Then spread out a second bandage, and lay same over the sides of the hip, pulling the point under the narrow bandage. Fold a hem on the lower border and take the two ends round the thigh, cross them, and bring them back and tie on the outside close to the base of the bandage. Then pull the point up tightly, bringing it over the narrow bandage, and pin the same (*see* Fig. 81).

THE KNEE BANDAGE.—Spread out a bandage and fold a wide hem on the lower border; then lay the same over the knee, hem outwards, the point upwards on the front of the thigh. Pass the two ends round the leg, and cross them neatly over the calf; then bring them to the front and carry them upwards, crossing them above the knee and securing the point. Pass them round the lower part of the thigh, and bring them to the front and tie. The point may then be brought down and pinned over the knot (*see* Fig. 82).

THE SOLE BANDAGE.—Fold a “narrow” bandage, and place the foot in the centre. Bring the two ends up and cross them over the instep, and take them round the ankle and tie.

THE FOOT BANDAGE.—Spread out a bandage and place the foot on the centre thereof, the heel being near the lower border and the toes towards the point (*see* Fig. 82). Take up the point of the bandage and carry it over the toes, front of the foot, and ankle. Then cross the two ends over the instep; carry them round the ankle once or twice and tie in front; or work them round the ankle once, cross them on the instep, pass and cross them under the sole of the foot, and tie on the instep. The point in either case should now be brought down and pinned (*see* Fig. 82).

CHAPTER VII.

ROLLER BANDAGING.

AS First-aiders we should certainly be familiar with the various means of applying a roller bandage to the several parts of the body and limbs. Supposing a doctor is called in to attend to a serious injury, and distance, coupled with an extensive practice, prevents his attending, say, more than twice a week, he may think it necessary to secure a dressing by a roller bandage, and desire that the dressing should be renewed each day. If so, he will be extremely glad to find that a member of the household understands roller-bandaging. He can then give his directions and know that they will be carried out, which will be a great assistance to him, and a benefit to the patient. Strips of any soft, white material will serve the purpose of roller bandages. The best are bleached, or unbleached calico, or finer cotton material.

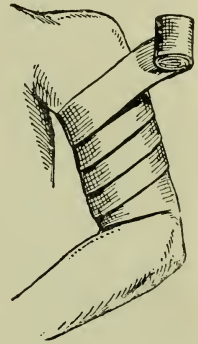


FIG. 83.—SIMPLE SPIRAL BANDAGE.

Roller bandages are of various widths and lengths, according to the limb or portion of the body which it is desirable to bandage.

Head	9 yards long	2 inches wide.
Shoulder or breast	10 " "	2½ " "
Arm	6 " "	2 or 2½ " "
Fingers	6 " "	$\frac{3}{4}$ inch "
Thumb	1 " "	$\frac{3}{4}$ " "
Leg	8 " "	3 inches "
Leg and foot	10 " "	3 " "
Body	10 " "	6 " "

It is best for the operator, as a rule, to stand in front of the patient when applying the roller bandage. Great care must be taken to apply the bandage firmly (not tightly), with an even pressure to the whole of the part. A slack bandage is useless, because one of the purposes of a roller bandage is to support the injured part.

There are eight methods of applying the roller bandage which a First-aider should practice.

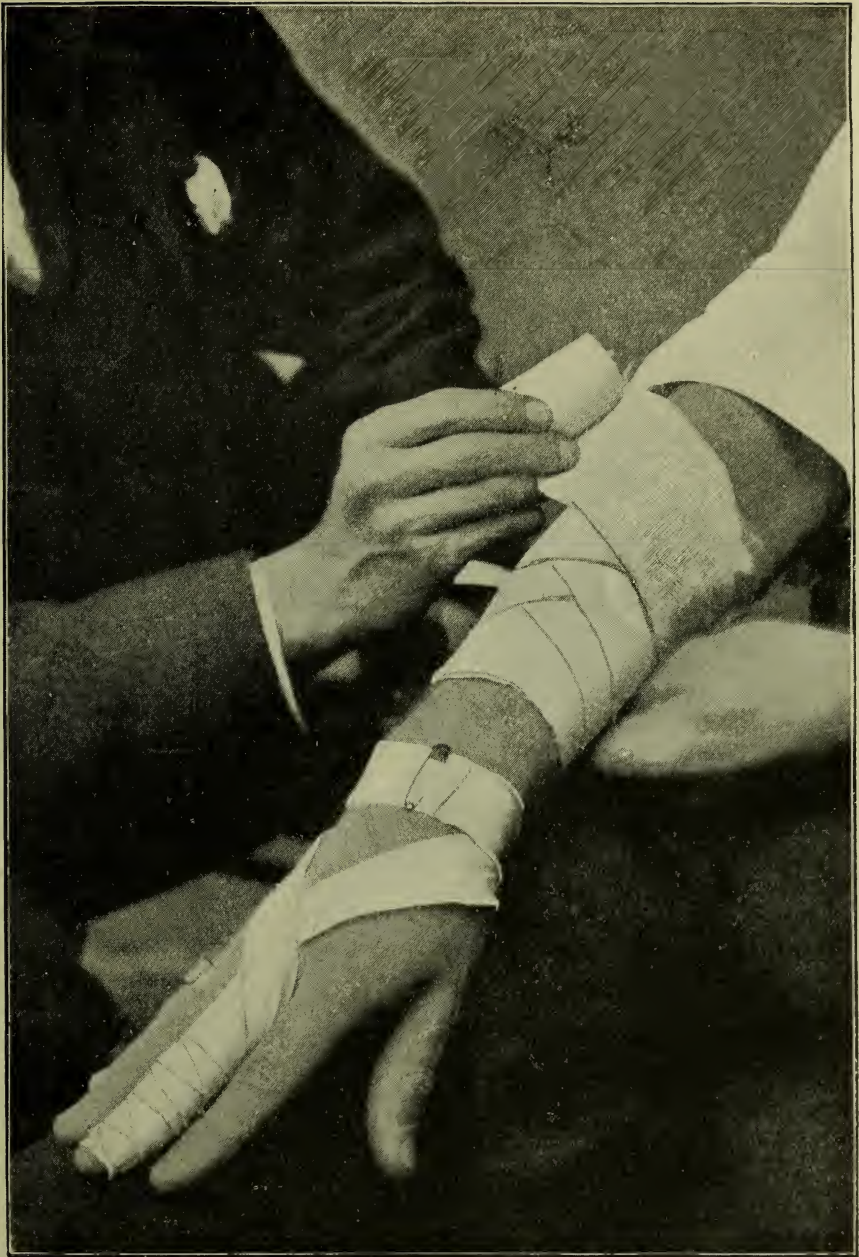
1. Simple spiral.
2. Reversed spiral.
3. Figure of eight bandage.



FIG. 84.—REVERSED SPIRAL BANDAGE.

4. Double-headed spiral, with reverses.
5. Capeline.
6. Spica.
7. Stump bandage.
8. Four-tailed bandage.

In bandaging a limb always COMMENCE ON THE INNER SIDE, and hold the bandage between the fingers and thumb of the right hand.



FIGS. 85, 86.—FIGURE OF EIGHT BANDAGE AND FINGER BANDAGE.

A SIMPLE SPIRAL BANDAGE.—We illustrate this applied to the upper arm (*see* Fig. 83). Commencing from the inside of the limb, and holding the roll of the bandage outwards, we obtain a grip by passing the bandage round the limb once or twice. The next layer must be passed round at an angle, each succeeding turn must leave the last layer half uncovered. This form of roller bandage cannot be applied to any part of the limb where there is a rapid increase of diameter, but only where the limb is almost straight. Where the limb increases in size the simple spiral bandage would GAPE open. In order to avoid this, and make the bandage secure and neat, we must adopt

A REVERSED SPIRAL BANDAGE.—This consists of the bandage being turned on itself (*see* Fig. 84). Having taken the bandage round the limb twice to secure a grip, place the thumb of the left hand on a layer of the bandage, in the centre, or rather more towards its upper edge. Then the other portion of the bandage must be held loosely, and by turning the right hand over, the bandage will fall into its proper position on itself. It must then be passed round the limb and tightened. This must be repeated until the bandage on the portion of the limb required to be covered is exhausted. The reverses must be made in a direct line; therefore the thumb of the left hand must be placed in the same position on each layer of bandage. About half the width of the bandage must be covered by each succeeding layer.

THE FIGURE OF EIGHT BANDAGE.—This bandage, when completed on the limb, has much the same appearance as the reversed spiral bandage, but it is applied in an entirely different manner. Commence by taking the bandage firmly twice round the limb over itself, in order to fix it. Do not forget always to bandage from the inside of the limb outwards. The third layer of the bandage must be taken boldly up the limb on the outside (*see* Fig. 88), round the back, and then down on the inside, overlapping itself in front: then pass it round the back of the limb, and take it again in an upward direction over the front of the limb to the outside, and round the back and down as before. Repeat the method until the limb is covered as far as needed (*see* Figs. 85 and 86). The amount uncovered of each layer of bandage must be equal. When finished fasten with a safety pin. It is the most useful and easy method of covering in

the elbow, knee-joint, or heel. When applying it for this purpose take the bandage over the centre of the joint and then make figures of eight, leaving the first turn visible (*see* Fig. 99). When bandaging a joint, it must be placed in the position in which it is to remain before the bandage is put on.

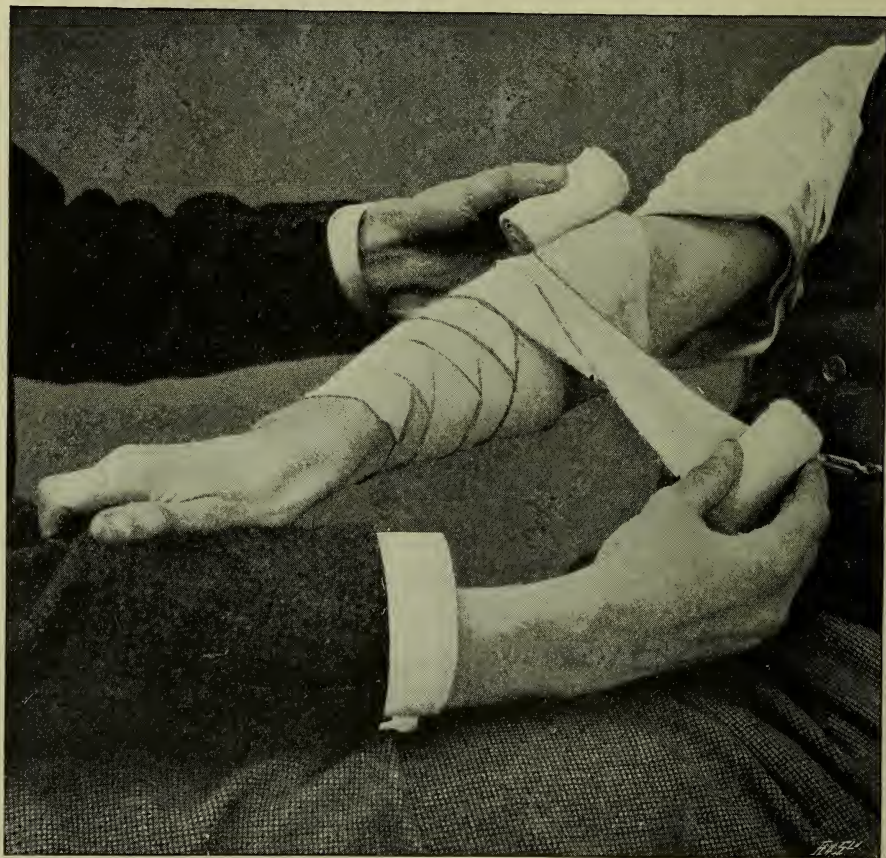


FIG. 87.—DOUBLE-HEADED SPIRAL BANDAGE, WITH REVERSES.

THE DOUBLE-HEADED SPIRAL, WITH REVERSES.—Stitch the loose ends of two roller bandages together, and, having done this, take one roll in each hand, and place the join in the bandages underneath the lower portion of the limb, and bring the rolls of bandage to the front: pass the roll in the right hand over to the left hand, and then pass that in the left hand into the right hand. The roll in the left

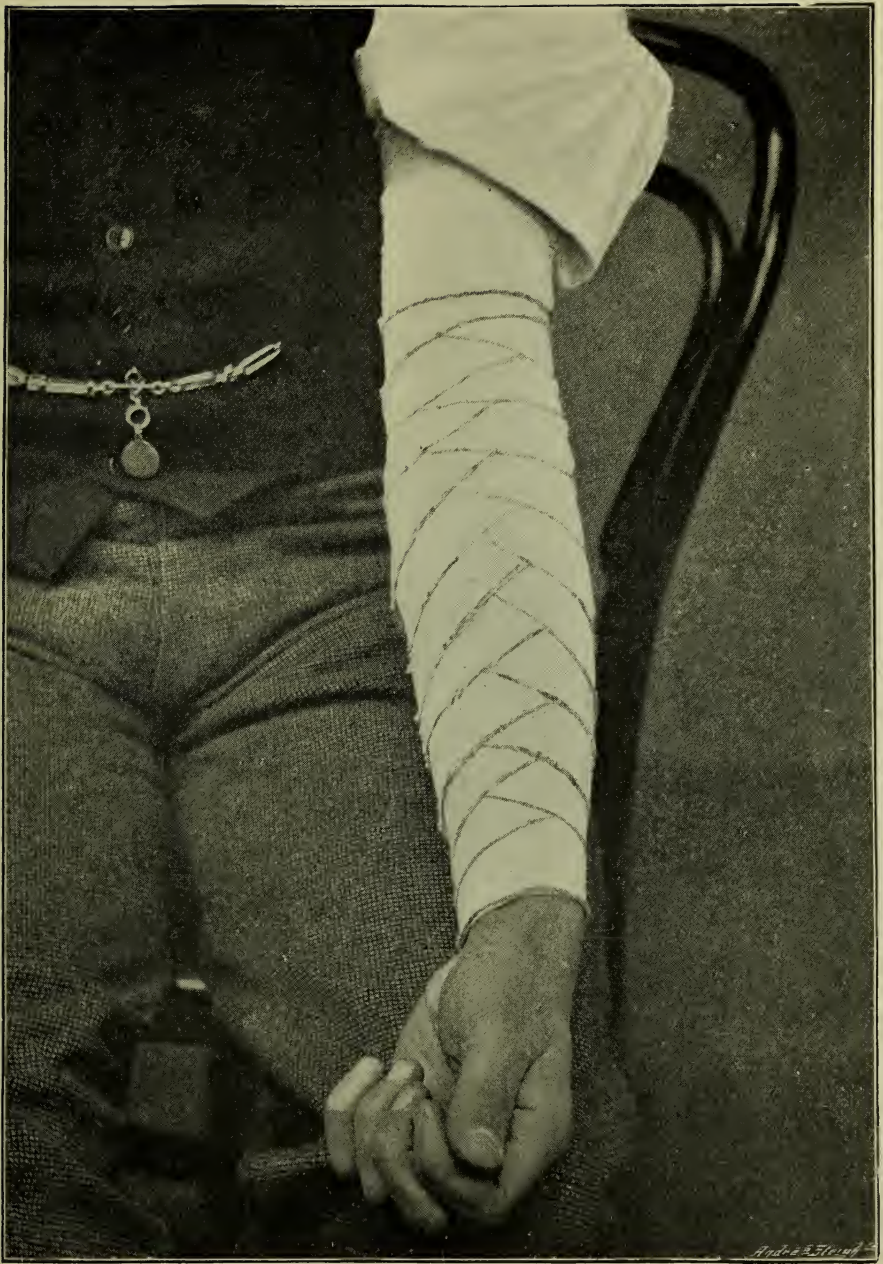


FIG. 88.—FIGURE OF EIGHT BANDAGE COMPLETED.



hand must be taken as a simple spiral (*see* Figs. 83 and 87) in an upward direction, and the roll in the right hand must be brought round the front and reversed (*see* Fig. 87). So that whilst one roll is being applied as a simple spiral to the limb, each layer is secured by the other roll



FIG. 89. — CAPELINE BANDAGE (FRONT).

making a reverse in each turn on the front of the limb. With practice this method may be applied neatly, and it makes a very secure form of bandage.

THE CAPELINE BANDAGE.—To apply the capeline bandage (*see* Figs. 89 and 90), stand at the back of a person seated in a chair. Having

pinned or stitched two roller bandages together, place this portion in the centre of the forehead close down to the eyebrows, bring the two rolls round behind the ears to the back of the head, and pass the roll in the right hand into the left hand (this must be the upper-

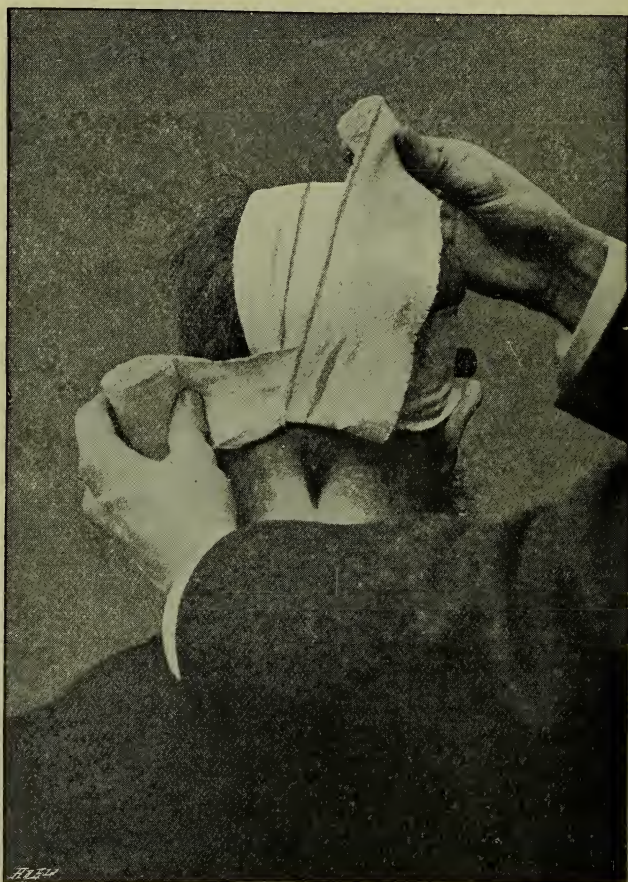


FIG. 90.—CAPELINE BANDAGE (BACK).

most). Then pass that in the left hand into the right hand. The passing of the bandage at the back must be below the occipital bone to prevent it slipping upwards. Continue the roll in the left hand tightly round the back of the head, and then take the roll in the right hand in a direct line over the top of the head and down the front of the forehead to the nose. Now the roll in the left hand must be

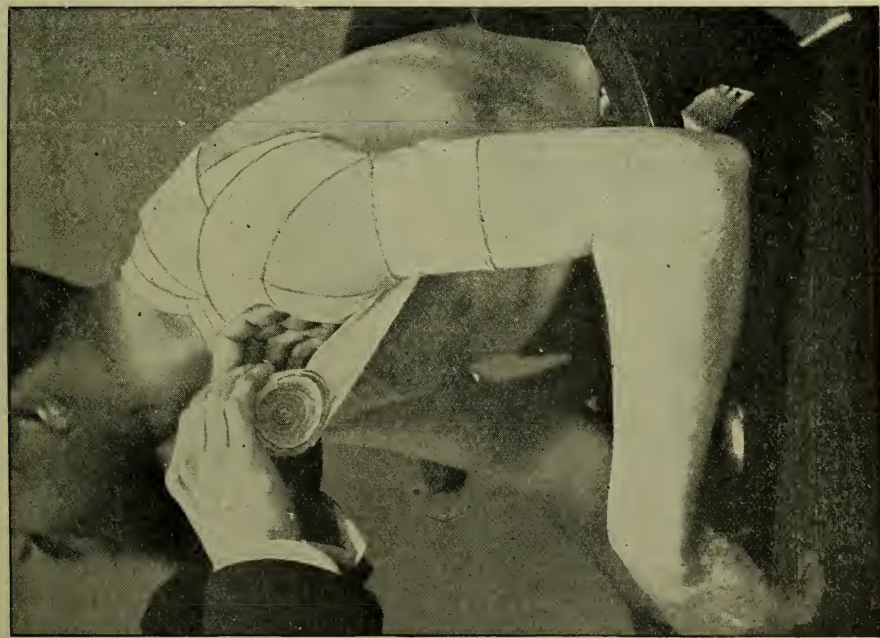


FIG. 91.—SPICA TO THE SHOULDER—METHOD.



FIG. 92.—SPICA TO THE SHOULDER—COMPLETED.

continued round the forehead to the back of the head, over itself. This will secure the roll which has been brought down over the forehead, and this latter roll must then be carried upwards and over the head one inch to the right of the bandage already across the head. This is again secured by the other roll at the back. These two movements are continued until the head is covered by the bandage crossing the head—alternately an inch right and left.

Half the head may be covered in this manner by taking the roll which crosses the top of the head always right or left, instead of right and left alternately.

When finished, the capeline bandage may be secured by a “reef-knot” or safety pin, in front or at the side.

THE STUMP BANDAGE.—A narrow roller bandage may be applied to a stump in the same manner as is described above for the head (Capeline). Or we may adopt recurrent bandaging (which is the same method as the Capeline); except that we must not continue passing one roll round and round the limb (to secure the roll crossing the stump), but hold the reverses of the bandage with the thumb on one side of the stump, the finger on the other, until all is covered. Then take the roll round the limb twice, over the reverses, to secure them.

SPICA TO THE SHOULDER.—To make this bandage commence by taking two secure turns round the arm close to the armpit. The second time, bring the roll through the armpit and take it upwards to the highest point over the shoulder that requires bandaging. Then carry it across the back and under the opposite armpit, over the chest, and across the shoulder to be treated, down and through the armpit, up and over the shoulder and round the back again (*see* Fig. 91). This and each successive layer must be an inch lower than the former, until the limb is covered (*see* Fig. 92).

SPICA TO THE BREAST.—This is a very useful means of support when a gland is affected. Make two turns round the waist in order to secure the bandage, and then carry the roller upwards under the lower portion of the breast, and take it over the opposite shoulder, down the back and straight round the waist again. Continue such bandaging over the breast and shoulder. Each successive layer of bandage

must be about an inch higher on the chest, breast, and waist than the preceding. In this way we may cover and support the breast (*see* Fig. 93).

The two breasts may be supported as follows: Having taken the bandage twice round the waist bring it across the back, over the shoulder, down under the lower portion of the opposite breast, round the waist and then carry the same upwards under the lower portion of

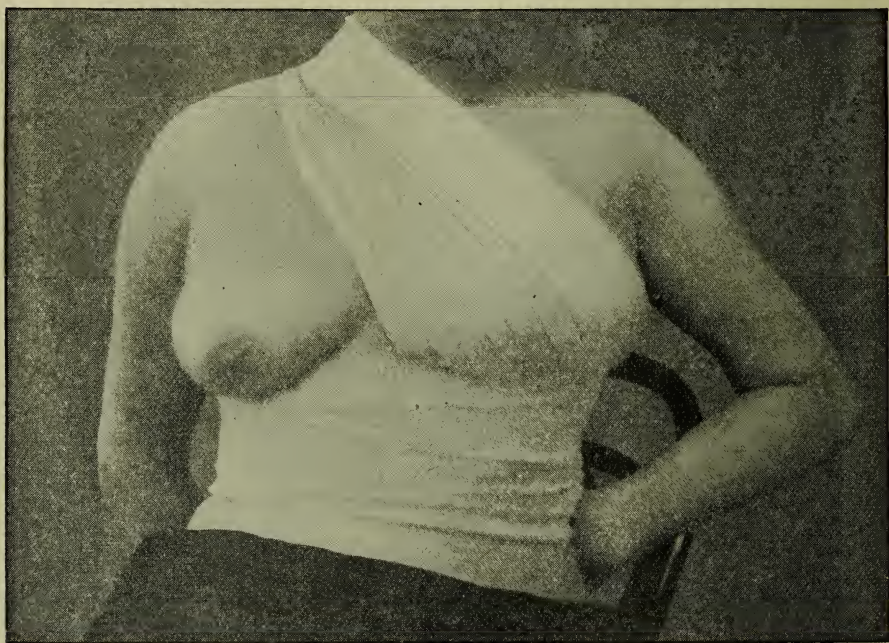


FIG. 93.—SPICA BANDAGE TO THE BREAST.

the other breast, across the opposite shoulder. This must be repeated until the breasts are well supported. Each layer of bandage must be placed an inch higher than the preceding one.

SPICA TO THE THIGH OR GROIN.—Take the roller from within outwards round the higher portion of the thigh, then make about three simple spirals or “figures of eight” to the top of the thigh. Pass over the front of the thigh, round the hip, across the back and over the opposite haunch-bone to keep it in position, then over the stomach and across the bandage already on the injured thigh, continue round the thigh, and bring the roll from within, and take it upwards over



FIG. 94.—SPICA BANDAGE TO THE THIGH OR GROIN.

the thigh. This and each successive layer must be about an inch lower until the thigh is completely covered (*see* Fig. 94). It will be noticed that the bandage is a series of "figures of eight" round the body and thigh. The point where the bandage crosses itself may be adapted to the hip, thigh, or groin, as required.

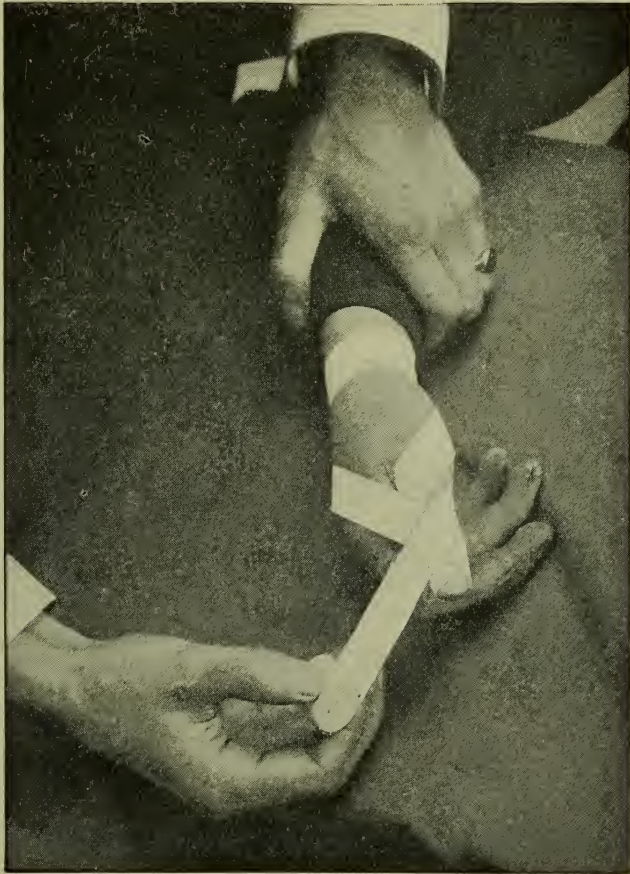


FIG. 95.—SPICA TO THE THUMB—METHOD.

SPICA TO THE THUMB.—The roller bandage to be applied to the thumb must be about three quarters of an inch wide. Take it round the wrist twice, from within outwards, to secure it, and then carry the bandage to the top of the thumb, not direct, but by a simple spiral. Come down gradually, by passing round the thumb and hand on

the "figure-of-eight" system. That is, take a turn round the top of the thumb, then over the back of the hand, round the wrist, up the inside of the thumb, round it to form a second loop (*see* Fig. 95), and this movement must be repeated round the thumb and hand until

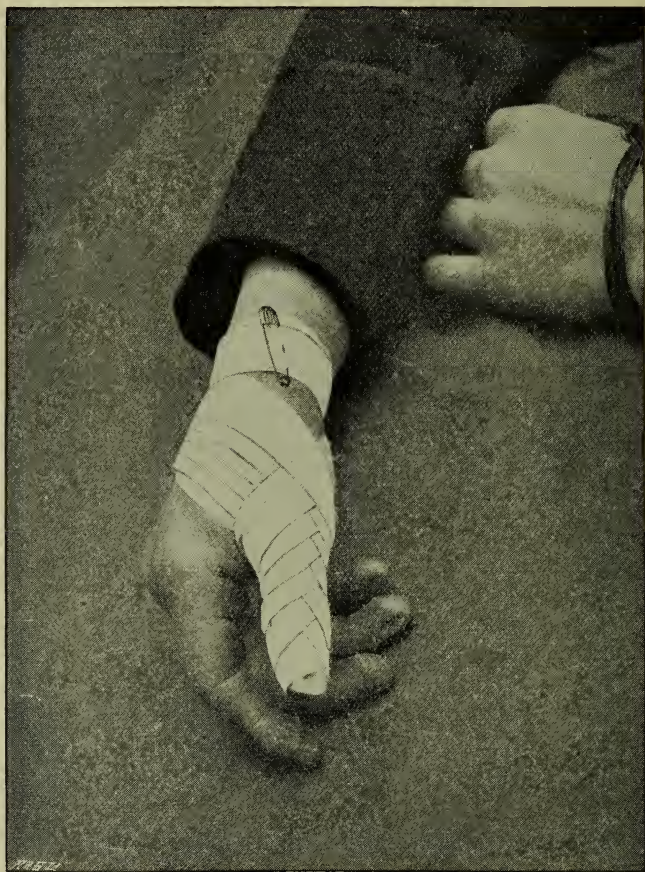


FIG. 96.—SPICA TO THE THUMB—COMPLETE.

the thumb is covered. Make a final turn round the wrist, and secure the bandage with a safety-pin (*see* Fig. 96), or a few stitches. Instead of the "figure-of-eight" system a reversed spiral bandage may be used. In this case, having ascended the thumb by a simple spiral, carry the bandage once round near the tip, then cover the thumb with reversed spirals and complete with a simple turn round the root before carrying



FIG. 97.—THE FINGERS BANDAGED.

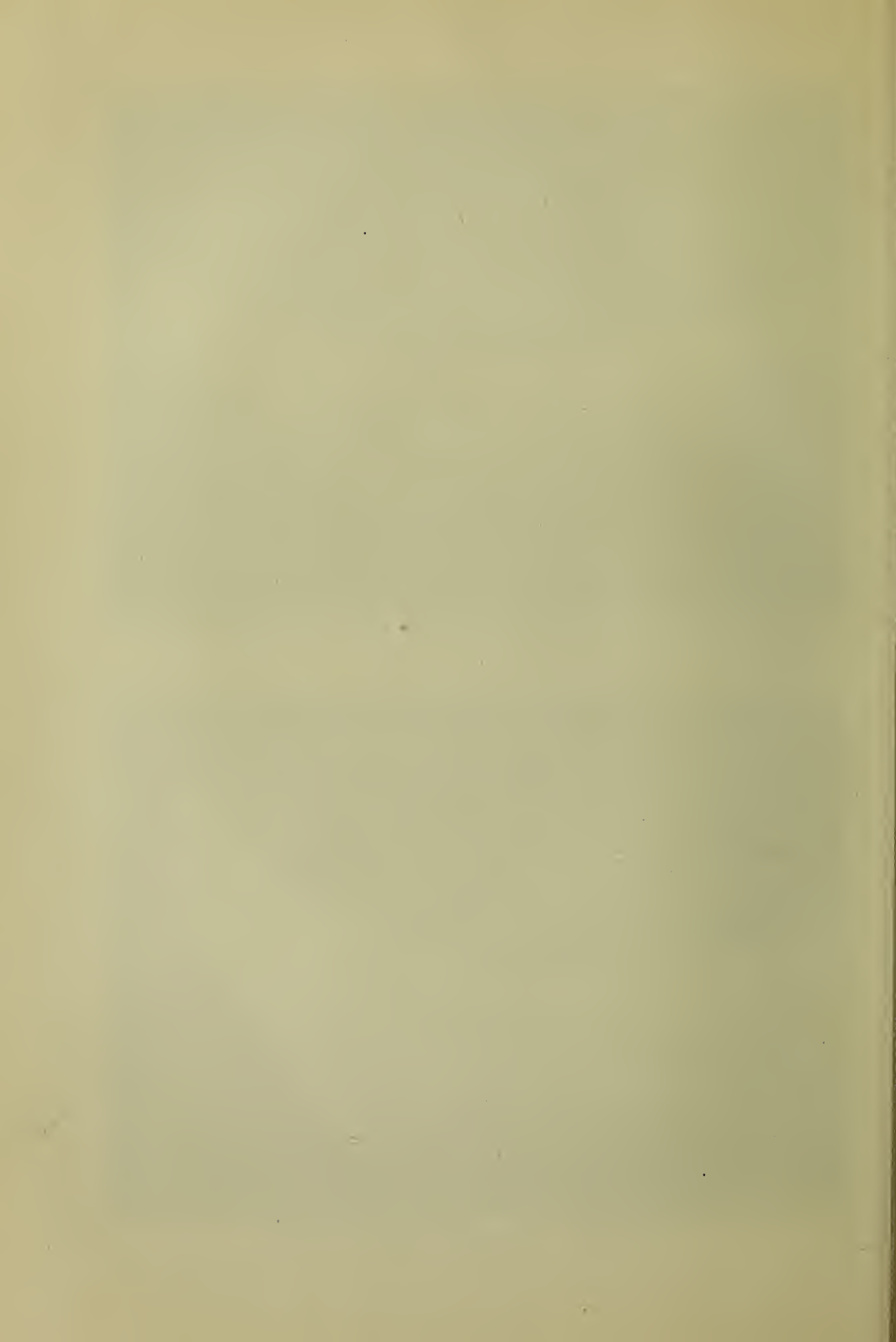




FIG. 98.—FOOT AND LEG BANDAGE LEAVING OUT THE HEEL.



FIG. 99.—FOOT, HEEL, AND LEG BANDAGE.



the bandage across the back of the hand to the wrist where it is secured as above.

THE FINGER BANDAGE.—The same width of bandage is required for the finger as for the thumb. Take it twice round the wrist to secure

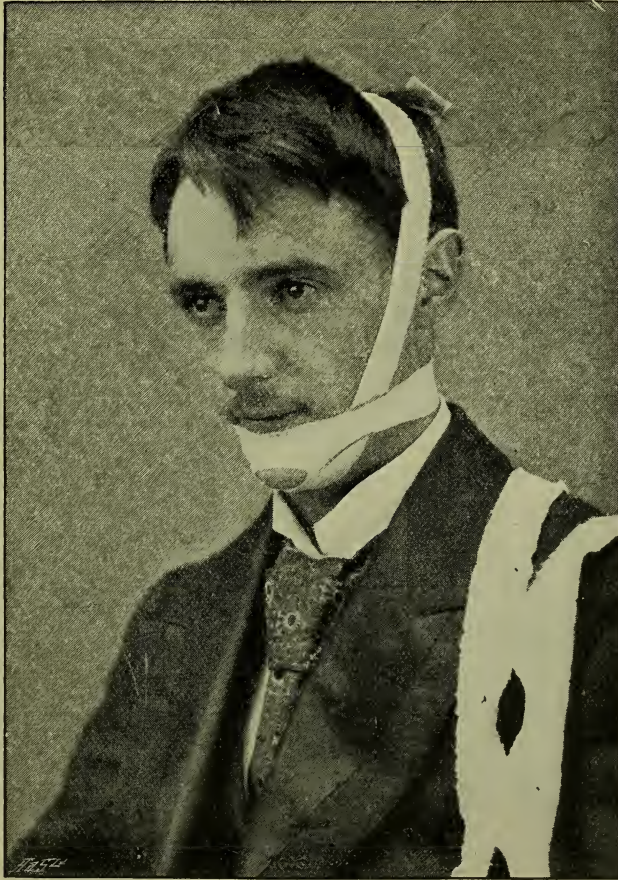


FIG. 100.—FOUR TAILED BANDAGE (FRONT).

it. Then carry it over the back of the hand and by a single simple spiral up to the top of the finger which is to be covered. Now bring the bandage down the finger, completely covering and supporting the same by the simple spiral or "figure of eight" system, finally bringing the

bandage out between the fingers, and taking it over the back of the hand and round the wrist. To secure it use a safety-pin (*see* Fig. 85), or a few stitches. *All the fingers* may be covered by the same means. Commencing round the wrist proceed to the little finger, and so

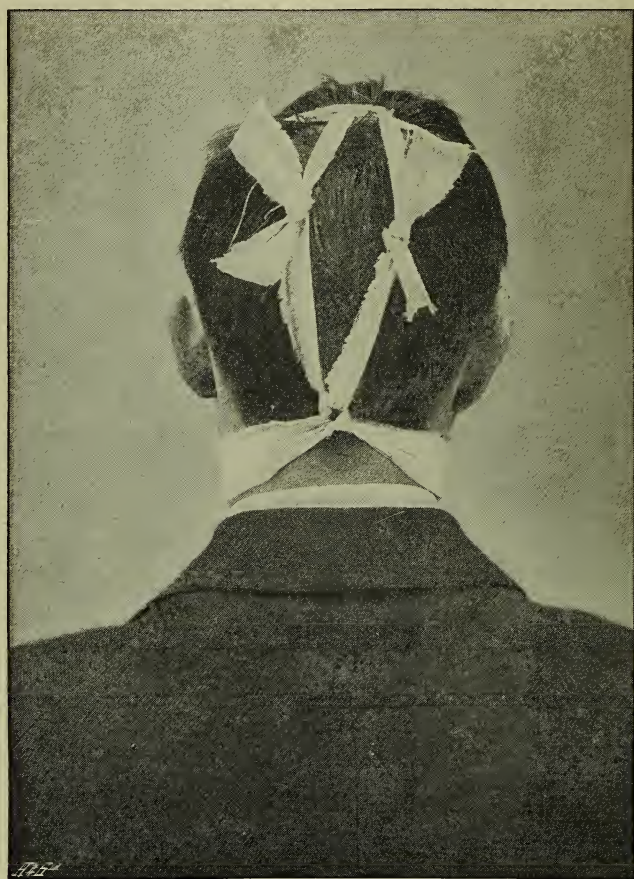


FIG. 101.—FOUR-TAILED BANDAGE (BACK).

to all the fingers till they are covered, completing each finger separately and going back to the wrist between each (*see* Fig. 97).

THE FOOT AND LEG BANDAGE (leaving out the heel).—Commence by taking the bandage twice round the foot near the toes, from within

outwards. Then apply a "figure-of-eight" bandage to the foot and ankle and a reversed spiral up the leg to the required distance (*see* Fig. 98).

FOOT, HEEL AND LEG BANDAGE.—The foot, heel and ankle are covered in by a "figure-of-eight" bandage and the bandage is continued up the leg by the reversed spiral system. This is the most difficult bandage to apply and requires much practice to accomplish neatly. Encircle the instep and heel, and commence a "figure-of-eight" bandage, gradually widening out until the part is completely covered. Then proceed up the leg by the reversed spiral system (*see* Fig. 99).

The elbow, when flexed, could be bandaged in the same way.

A FOUR-TAILED BANDAGE.—This is useful for a fracture of the lower jaw. Take a piece of roller bandage, two inches wide and about thirty-six inches long, cut a small piece out of the centre in order that it may fit the chin, then slit with scissors and tear from the ends (*see* Fig. 100). The chin is placed in the slit of the bandage, the two lower tails are taken up over the top of the head and tied, leaving long ends. The two top tails are then taken round to the back of the neck and tied (*see* Fig. 100), also leaving long ends. These four long ends are tied at the back of the head as shown in Fig. 101.

CHAPTER VIII.

THE JOINTS.

THE Joints are the points of the bony framework, or skeleton, where the bones articulate, or move, one upon another. Where they unite to form a joint they are covered with cartilage, or gristle, which prevents jarring; and a thin membrane, called the synovial membrane, secretes oil which enables the joints to work easily. The joints are generally the seat of chronic rheumatism, which is brought about by a change in the surface of the cartilage, and by the synovial membrane being affected. The synovial oil acts much in the same way that oil does in preventing friction between parts of machinery.

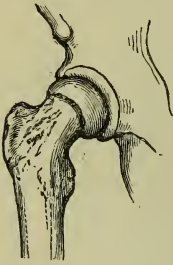


FIG. 102.—BALL AND SOCKET JOINT.

There are joints which are immovable, such as those which unite the bones of the skull. Those connecting the various vertebræ (spine) allow of some movement, also the joints of the bones of the wrist and foot, and the sliding action of the bones of the arm—the Ulna and Radius. But the joints which most concern a First-aidier and those with which he, or she, may have to deal, are the following:—

The BALL and SOCKET joints, such as are seen at the shoulder and hip (*see* Figs. 102 and 103).

The HINGE joint, as at the elbow and knee (*see* Fig. 104). The joints of the jaws are also on the hinge principle, with slight additional movements from side to side.

The bones are secured in position at the joints by strong bands of fibrous tissue, which are called LIGAMENTS (*see* Fig. 105). The silvery ligaments may be seen in any joint of meat.

DISLOCATIONS.—Dislocation means displacement, or the slipping apart of bones at the joint. DISLOCATION CAN ONLY OCCUR AT A JOINT. It is a very painful accident, as usually the ligaments attaching the bones are ruptured or torn. The dislocation may be *partial* or *complete*,



FIG. 103.—BALL AND SOCKET JOINT—SECTION.

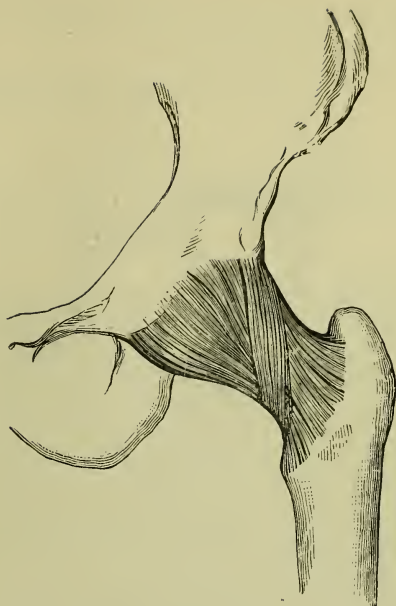


FIG. 105.—LIGAMENTS.

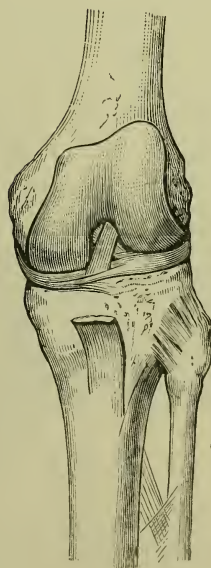
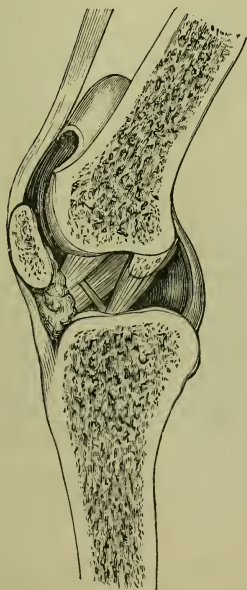
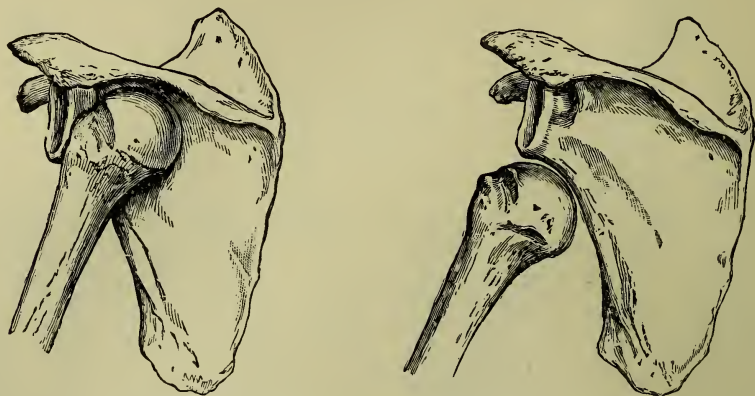


FIG. 104.—HINGE JOINT—SECTION AND COMPLETE.

and in some cases there may be a wound. Then the proper term is a *Compound Dislocation*.

A dislocation is caused by violence, which may be direct on the



FIGS. 106 AND 107 —EXAMPLES OF DISLOCATED HUMERUS.

joint affected or indirect, that is to say, we may fall on the elbow and put the shoulder joint out. Sometimes dislocation occurs through muscular action; in yawning we may put the jaw out of joint.

The ball and socket joint at the shoulder (*see* Figs. 106 and 107) is the most common joint for dislocation. The arm has a large range of movement, the cup in the shoulder-blade (scapula) is very shallow, and the ball end of the humerus, or arm-bone, is easily displaced. Only a medical practitioner should attempt to replace the separated bones, or, to use the technical phrase, “reduce the dislocation.”



FIG. 105.—DISLOCATED JAW.

SIGNS OF DISLOCATION.—These are similar in some respects to those of fracture, but very different in others.

There is loss of power in the limb.

The limb is fixed (not unnaturally movable, as in fracture).

There is great distortion.

There is no CREPITUS, or grating, as in fracture.

The limb cannot be adjusted in any way by pulling the bones gently.

There is great pain at the joint and also swelling.

TREATMENT.—We have stated that medical aid should be called to reduce the dislocation, and we now emphasise this point.



FIG. 109.—TREATMENT OF FRACTURED CLAVICLE.

[DISLOCATED SHOULDER: WITHOUT PAD IN ARMPIT.]

THE FIRST AID TREATMENT is to prevent further injury, and to support and fix the limb by bandages, and sometimes by attaching splints.

DISLOCATION OF THE JAW (*see* Fig. 108) is the only case, except that of the thumb or fingers, in which a First-aider may attempt the reduction of the dislocation if a medical man is not easily within call.

The method to adopt in a case of dislocation of the jaw is as follows:—The thumbs must first of all be covered with a towel, or some material to prevent their being bitten, and then pressure must be put on the back teeth, downwards and backwards. If this is done properly the jaw will go back into its correct position with a sharp jerk.

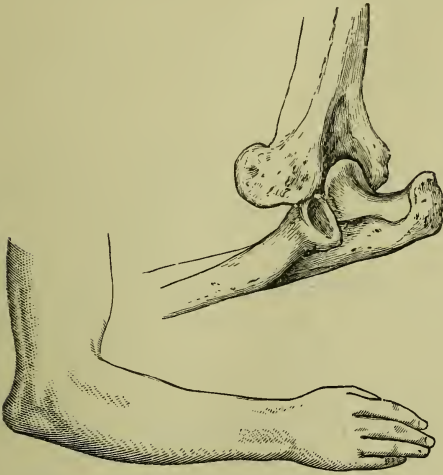
DISLOCATION OF THE SHOULDER.—The arm should be bent, or flexed, and placed in a large arm-sling. The arm must be secured to the body by folding a broad triangular bandage and placing it round the arm and body, outside the large arm-sling, tying the same in a reef knot on the opposite side (*see* Fig. 109 but without pad in armpit). The patient may then be safely moved for medical attention.

DISLOCATION OF THE FOREARM AT THE ELBOW.—The appearance of the displacement is depicted in Fig. 110 and that which takes place is shown in Fig. 111. The best method to prevent further injury in a case of this kind is to obtain two pieces of wood, flat pieces are preferable, and bind them together so that they almost form the letter L. Then fix the limb on to the same by folding broad triangular bandages and passing one round the arm-bone (humerus), and the splint, and another round the bones of lower arm, tying same in reef knots afterwards supporting the limb in a large arm-sling.

DISLOCATION OF THE FEMUR or THIGH BONE (*see* Fig. 112).—Great care must be used in handling a person suffering from the effects of dislocation of the femur. If the patient has to be removed for medical assistance, he should be lifted with as little movement as possible on to a stretcher, shutter, or something that will not allow any alteration in the position of the limb. If medical aid is available, always try to get the dislocation reduced at once, on the spot where the accident occurs, and make the patient as comfortable as possible. If medical aid cannot be obtained quickly, and the patient is suffering great pain, the part must be stripped and warm fomentations applied.

DISLOCATION OF THE THUMB or FINGER.—Such a dislocation would be one of the phalanges, put out of position. Phalanges is the name given to the bones of the thumb and fingers. A First-aid-er may attempt the reduction of the same by pulling firmly, but gently. Rough treatment must be avoided. A snap will be heard when the bone regains its proper place.

SPRAINS.—We often hear the expression, “I have ricked my ankle.” This would probably imply a slight sprain. A sprain means an injury



FIGS. 110, 111.—DISLOCATION AT THE ELBOW.

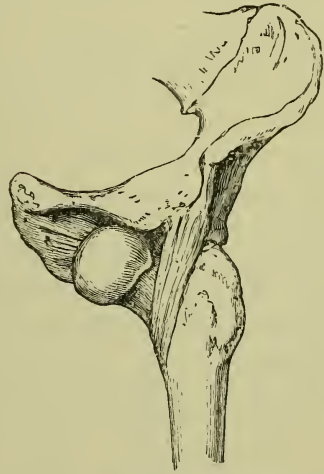


FIG. 112.—DISLOCATION OF FEMUR.

of the ligaments, with which the bones are united at the joints. The foot, for instance, gets turned over owing to stepping on something which is movable, and the ligaments of the ankle-joint are stretched and torn. An accident of this kind is often very painful, and is not without danger, for at times a disease of the joint is the outcome. Sprains are occasioned by falling down, or by some unnatural movement of a limb. Those of the wrist or ankle are the most common sprains, but the knee and elbow are often subject to such injuries. Ladies often rick or sprain their ankles, owing to the shape and size of heels on their boots and shoes. Anyone suffering from weak ankles should never wear shoes.

SYMPTOMS.—It is not at all difficult to recognise sprains, the symptoms being particularly clear. The sufferer will complain of pain

which produces a feeling of sickness; in a severe case the patient will faint. There will be swelling and discoloration at the joint affected, almost immediately. This is caused by the tearing of many of the small blood-vessels at the seat of the injury.

TREATMENT.—If we have nothing else at hand, *pressure should at once be applied* by tying a handkerchief (folded neatly) lightly but firmly round the sprained part. If this is done speedily the hæmorrhage, or bleeding, of the capillaries is arrested, and the development of inflammation is stopped in consequence. If a roller bandage is available, this should be applied firmly by the “figure of eight” method (*see* p. 93).

If *cold* can be obtained, this should at once be used. Ice, if at hand, is best. Tie the ice up in oil silk, and place it on the injured part. Failing this, cold-water cloths should be firmly strapped on with a roller bandage or handkerchief. If the water be diluted with *eau-de-Cologne*, vinegar, or arnica, it is better. The cloths should be wetted frequently, as the heat arising from the inflammation will soon dry them. A very useful remedy is to allow the cold-water tap to run over the sprain, or, better still, pour cold water from a height on to the part.

The cold treatment must not be kept up too long, or the part will lose its vitality. If the pain continues severe, hot applications must be resorted to. Water, as hot as the patient can endure, or hot fomentations; linseed, bran, or oatmeal poultices can be used, and will afford great relief. Evaporating lotions may be used with benefit.

When the wrist, thumb, or fingers are sprained, after treatment, the arm should be bent, or flexed, and placed in a large arm-sling. Be sure and see that the hand is higher than the elbow. When the injury occurs to the lower limb, the sufferer should recline and keep the foot elevated on a pillow, or suspended in a sling.

BAD SPRAINS ARE WORSE THAN FRACTURES, and sometimes occasion a lot of trouble and take a long time to heal. We cannot be too careful if the knee is sprained. Rest should be insisted upon, and a splint placed at the back of the joint to prevent movement. Suppose a person should have the misfortune to sprain the ankle-joint when some distance from home or medical aid; *it would be very foolish* to remove the boot, as swelling takes place so quickly, and the boot could not then be put on again. It is far better to apply pressure by tying a handkerchief or bandage tightly round outside the boot. Men often

say, "I sprained my foot, but walked it off." This would imply a slight sprain, but nevertheless it is a dangerous practice, and may lead to further injury. Sprains are sometimes walked off; this, as it were, kneads the joint and effects a cure; but it may have the reverse effect, because we cannot discern at the time what is the extent of the injury. Exercise is certainly not advisable under such circumstances, for if the capillaries are injured it will cause greater hæmorrhage and therefore swelling.

MEDICAL AID SHOULD ALWAYS BE SOUGHT in cases of sprains, for injuries of this nature may have serious results; but a First-aider can always adopt the foregoing treatment with safety, pending the arrival of such aid. IF ANY DOUBT ARISES as to whether the injury is a sprain or a fracture, THEN TREAT IT AS A FRACTURE.

STRAINS.—This expression implies that the muscles are torn or injured. The mischief is usually brought about by sudden exertion. There is generally swelling and soreness at the part affected. In speaking of the construction of the muscles we said that they were composed of fibrous tissue; in a severe case of strain the fibrous tissue may be torn or ruptured. If so the person will cry out, and should the rupture occur to a muscle of the leg he will fall down as if shot and only be able to rise again with great difficulty.

TREATMENT.—In a case of this kind a First-aider should assist the sufferer home, or, better still, if help is at hand, carry him, and afterwards insist upon quiet and rest, with the limb raised. If the injury be to a muscle of the arm, the limb should be placed in a large arm-sling, keeping the hand slightly higher than the elbow; if the muscle of the leg, the patient should lie down and elevate the limb slightly.

Medical aid should be sought as soon as possible, but if this is not forthcoming and there is pain, apply hot fomentations. If the large tendon (Achilles) at the back of the ankle be injured, the patient should lie in a recumbent position with the leg elevated and the knee flexed, or bent.

BRUISES.—We pay very little attention to injuries of this nature, and in slight cases the affected part regains its normal aspect without

any assistance or remedy being applied; but not always so, and at times bruises are very troublesome and painful. The discoloration that takes place is due to capillaries being injured, and therefore there is an effusion of blood in the part immediately beneath the skin. If a bag of blood forms it is probable a vein has been injured, and it is better that this should be left alone.

Bruises are sometimes called **CONTUSIONS**, and are caused as a rule by a blow or knock from some hard substance which does not create a wound. The bruised part will become bluish in appearance, and afterwards during the healing process it will pass through numerous shades of colour.

TREATMENT.—As in sprains, the first thing to do is to arrest the bleeding of the injured capillaries, as the swelling and discoloration are due to this, therefore **COLD** and **PRESSURE** may be applied as in sprains, and in severe cases quiet rest and elevation of the injured limb will be necessary. Stimulating lotions may be applied gently with success. If, however, the bruises become more painful, and inflammation sets in, seek medical advice, as matter will form, and there is a probability that an abscess will be the result.

If the **KNEE** should be bruised, rest should be taken if possible, as any injury to this part may have bad results, and in such cases the old adage, "a stitch in time saves nine," is particularly applicable. We have known cases where a simple accident to the knee has occasioned months of trouble, all of which might have been avoided by the exercise of a little care and rest at the outset. It is true that our bodies are beautifully and wonderfully made; which renders it all the more essential that we should learn how to take care of them. If possible people should avoid doing anything that is likely to injure the knees, but should we have the misfortune to meet with an accident injuring this part, we must not neglect it; it may be serious.

A **BLACK EYE** is, unfortunately, a very common form of bruising. This is a most annoying injury, because no matter how it came about, it is generally put down as the result of a quarrel. Discoloration takes place very quickly, and the sooner a remedy is applied the less black the eyelid and the surrounding part will become. Cold water as a rule is easily obtained, and a handkerchief soaked in the same and smoothly applied with pressure to the part will be very beneficial. Hot water is also used with similar results. A piece of raw meat—the country

people generally prefer raw steak—if applied with moderate pressure, is also useful. Starch and arrowroot, moistened with cold water, if applied at the time of injury, are good remedies. A *pinch* is a special form of bruising, and in such a case the blood (effusion) will form a sac, and in cases of a thumb, fingers, or toes the blood will accumulate under the nail, and this often leads to the nail coming off. Cold applications at the time of injury will probably prevent this occurring.

CHAPTER IX.

FRACTURES AND SPLINTING.

THIS is the most important subject with which First-aiders have to deal, and it will now be our endeavour to give them, in as few words as possible, sufficient information concerning fractures and splinting as will put our readers in a position to enable them to diagnose such injuries and to render the First Aid treatment, which we shall prove is so essential in a case of fracture.

A fracture means a "break" (Latin, *Frango*, "to break"), and is the term used to imply a broken bone. An idea is common that "fracture" and "broken bone" have separate meanings. This is quite erroneous; they are one and the same thing.

The cause is generally direct or indirect violence; that is to say, the bone may get a direct blow and be broken, or you may fall on the hand and fracture the collar-bone (*clavicle*). Again, the thigh may be broken by stepping heavily on to the foot.

There are various kinds of fractures, but they are generally classed under four heads with the following names:—SIMPLE, COMPOUND COMMINUTED, and COMPLICATED.

A **SIMPLE FRACTURE** is where the bone is merely broken, and there is no other injury apparent.

A **COMPOUND FRACTURE** is where the bone is broken and there is a wound in the flesh leading down to the broken ends. This is caused by the end of the broken bone piercing the flesh, and is generally due to the rough handling on the part of someone wishing to render service, but without any knowledge. It is a sad and not uncommon sight to see an injured person placed in a cab, while all

concerned are ignorant as to whether they are not converting a simple fracture into a compound one.

A **COMMUNUTED FRACTURE** is where the bone is broken in several places or splintered by crushing. Railway accidents often have this result. If a limb gets severely jammed it will probably result in a comminuted fracture.

A **COMPLICATED FRACTURE** is where the bone is broken and the sharp ends of it have injured the surrounding parts, and perhaps torn a large blood-vessel. Or the ribs may have been broken by violence, and in such a way that the jagged edges of the bone pierce an organ of the body.

Some of the further injuries in cases of compound and complicated fractures are occasioned by the patient struggling.

There is another class of fracture which is termed **GREENSTICK** (*see* Fig. 113). It bears this name as the fracture has much the same appearance as a broken or bent young branch, or twig, of a tree in spring time. It does not exactly break but partially gives way and splinters. This is the nature of the fracture which occurs in the

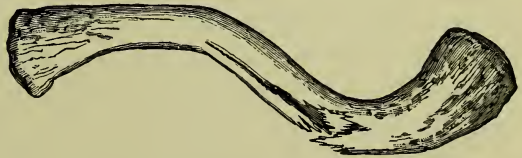


FIG. 113.—GREENSTICK FRACTURE.

case of accidents to children—the bones being principally composed of gristle, they have a tendency to bend. Children who are “rickety” are more likely to suffer from such injuries. Great care should be used by those who have charge of the young; even pulling a child suddenly may result in a greenstick fracture, and unless the child can make you understand there is pain at a certain point, you will probably never know what the little sufferer has undergone till a mal-formation is discernible in after-years.

The bones of old persons are much more likely to break than those of the young. As we advance in years the bones become more brittle, and we occasionally hear of a fracture occurring in the case of elderly persons without any violence having been used. Of course the bone may be diseased, but even without such a cause, the bone may be sufficiently brittle to break with very little extra strain being put upon it. The following are the indications for which we should watch:—

SIGNS OF FRACTURE.

1. Pain. At the seat of the injury, and also
2. Swelling. Which will be accompanied by the bluish appearance of a bruise.
3. Crepitus. A grating noise which is caused by the jagged ends of the bones coming into contact.
4. **UNUSUAL SHAPE** of the limb.
5. **SHORTENING** of the limb.
6. **INCREASED MOBILITY** or manner of movement of the limb.

A First-aider *should not persist in trying to find crepitus* in a fractured limb, as it tends to irritate the part affected and to inflame it.

PREVENTION OF FURTHER INJURY.

It is during the time that elapses between the accident and the setting of the fracture that the greatest damage is done. Kind willing hands often do more harm than good, because, as a rule, they are not in any way versed in the subject of broken bones.

We must always remember that—THE SHARP EDGES OF BROKEN BONE ARE LIKELY TO INJURE the surrounding parts, and even with very little movement they may pierce an important blood-vessel. The greatest care should be displayed, therefore, in handling a fractured limb. **LIFT, OR MOVE IT VERY GENTLY.**

If the patient is conscious, he will probably be able to give some particulars which will help to a discovery as to the nature of the injury. In all cases reassure the sufferer as much as possible, and ask him to keep quiet.

Accidents usually occur out of doors, but should they take place in the house, as long as you can induce the patient to remain quiet, you need do little else beyond very carefully placing the limb on a cushion or pillow, and sending for medical aid at once. The sole reason that First Aid treatment is required in such cases is because the injured limb cannot be kept in a state of rest.

We can picture some friends out on the moors; one slips and falls, and exhibits some signs of pain in the leg; the others naturally go to his assistance, and most likely lift him up, saying "Try and stand; it will be better in a few minutes." After holding him up a little while, one suggests "Try and walk," and perhaps he makes an attempt to do so.

Before saying more, let us first of all ask ourselves "Are not such

scenes as this occurring every day, not only in this 'tight little island' of ours, but all the world over?" If everyone had the knowledge they should have—and we hope the day is not far distant when at any rate the Government of this country will see that every boy and girl obtains an initial knowledge of such an important subject as "First Aid to the Injured"—then the foolish practice which we have pictured would never be heard of, there would be far less suffering, and more than this, many lives would be saved.

To resume—after his "friends" have put the sufferer on to his feet and he has tried to take a step, becoming faint from pain he sinks, and then it may dawn upon his "would-be-helpers" that they have done some harm. They do not, however, realise the serious mischief they have probably created. A SIMPLE fracture has almost of a certainty been made COMPOUND. A broken end, it may be of the thigh-bone, has pierced through the flesh and is exposed. In its course it has probably penetrated one of the large blood-vessels, say an artery, and then as the result, with no one near understanding the course of the blood-vessels, a few moments suffice to put an end to life.

Supposing in its progress through the flesh, the jagged end of bone has missed the larger blood-vessels, it has of course created severe damage to the flesh, or perhaps has severed a nerve; but more than this, if the broken end of the bone and its marrow be exposed to the air, most serious results will probably follow. The person may get blood-poisoning. Erysipelas may set in and then a limb may have to be amputated; or, worse still, the result may be fatal.

REMEMBER ALWAYS THAT A COMPOUND FRACTURE IS A MOST DANGEROUS THING, and is usually created from a simple break by those uninitiated willing helpers, ever anxious to do a good service, but who in their ignorant attempt unfortunately so often succeed in doing a bad one. Sometimes, as we explained before, it may be caused by the restlessness of the patient, or by the severity of the injury.

It is at times easy to diagnose a fracture, and then we do not advocate the removal of clothing from the limb injured, as it will act as padding to an improvised splint. Occasionally, a First-aider will have to slit the sleeve of the coat or the leg of the trousers, and this should be done so as to cause as little pain as possible to the sufferer. Of course, if there should be bleeding, the clothing must be removed to ascertain the nature of the bleeding, and should this be done, SLIT THE COAT AWAY ON THE SIDE REMOVED FROM THE INJURY. Do not attempt to take off the clothing by any other means, and

be sure to cut the garment at the seams; there is no need to destroy clothing.

It is most inadvisable to, in any way, remove a person suffering from fracture until it has been secured by splinting, even should the accident occur in the middle of the roadway. We insist that the First Aid treatment should be carried out on the spot, and that no attempt be made



FIG. 114.—IMPROVISED SPLINT TO FRACTURED HUMERUS.

to even carry the patient to the footway or side of the road until this be done. Never allow a person with a fractured leg to be placed in a cab. He must be carried on a stretcher, hurdle, or a shutter, and those who carry him must NOT WALK IN STEP, neither must they stiffen the knee-joint when walking.

SPLINTING.

First-aiders will find it a very good plan to keep a set of ready-made splints. As a rule, however, when called upon to render First-



FIG. 115.—IMPROVISED SPLINT TO FRACTURED LEG.

Aid, we have to use what comes to hand—newspapers or magazines, folded to the proper shape, straw bottle-covers, match-boardings, fire-wood, wicker flower-pot covers (*see* Fig. 114), cigar-boxes, broom-handles, walking-sticks, umbrellas, folded coat (*see* Fig. 115), bark of trees, twigs, reeds or stockings filled with straw. The military man may use his rifle, bayonet, sword scabbard: the policeman his truncheon: the cricketer, the stumps: factories and workshops have plenty of suitable material, and even the tools will act as splints. In railway accidents there is always the material ready at hand. The First-aider must always keep his eyes open and look around for splinting, and in the event of nothing being available, the sound leg must become the splint in a case of fracture of a lower limb.

The size of splints, whether improvised or not, will depend upon the limb that is fractured. Should it be the thigh, the splint should reach (if possible) from the armpit to the ankle. *All splints must be padded* with some soft material, otherwise they will give pain. See that projecting bones are well protected. In putting a splint down the entire length of the leg, protection would be needed for the haunch-bone, the side of the knee-joint and the ankle.

The splints should be secured to the limb by bandages, or something that will act in a similar manner, in a way which will allow of their ready removal by a surgeon. *All knots must be tied properly*, and the “reef-knot” is the only one that should be used (*see* Fig. 69). As we do not usually carry triangular bandages about with us, it is well to point out that handkerchiefs, neckties, or braces can be used for the time being, and if necessary we must tear strips of clothing and use them for securing the splints.

IF THERE SHOULD BE SEVERE BLEEDING THIS MUST BE ATTENDED TO BEFORE THE FRACTURE IS SPLINTED, otherwise a life may be lost whilst we are attempting to save a limb.

If a fractured limb should require lifting for any purpose, we do so by placing both hands beneath it—one above and the other below the seat of fracture, and grasp the limb with care, yet firmly.

When securing a splint, lay the centre of a triangular bandage, folded narrow, over the upper portion of the outside splint, pass the two ends round the limb and cross them neatly and smoothly over the inside splint; then bring the ends to the outside splint again and tie in a “reef-knot.”

ALL KNOTS MUST BE TIED ON THE OUTSIDE SPLINT.

Having secured the two upper ends of the splints above the fracture,

restore the limb to its natural position by *very gently pulling* and adjusting the same. When doing this, compare the injured limb with the sound one. A First-aider has *only to reduce the deformity*, should it exist; it is not intended that he should attempt to set the fracture, or even to replace the fractured ends in their accurate positions. The bones, when fractured, are usually displaced, sometimes by the nature of the accident, but frequently by muscular action.

Should the patient be faint give him a drink of cold water or a little sal-volatile in water. In another chapter we deal with the removal of injured persons, and also with the special methods of making beds for those suffering from fractures.

CHAPTER X.

TREATMENT OF SPECIAL AND COMMON FRACTURES.

BEFORE proceeding to treat of this subject, we will endeavour to give, in a few words, a short account of what takes place when a fracture is healing.

Anyone who is healthy may notice how quickly the flesh heals when we get a cut, and it is very similar with bone. The jagged edges are softened by a mass of new substance which is soon formed round them, by blood that has exuded. This soon becomes a strong fibrous tissue, and then lime-salts convert it into bone, and the limb is as sound as it ever was. The younger the person the sooner the healing process is completed. The period required for the healing varies according to size of the fractured bone. For instance, a finger bone does not take as long as a thigh-bone. We require about eighteen days for a finger to heal, and about twelve weeks for a thigh. The arm or leg bones take about six weeks. There is often trouble in healing the bones of elderly persons; at any rate, the process is always slow.

The SIGNS and TREATMENT of special and common cases of fracture are as follows:—

FRACTURE OF THE SKULL.—There is very little that a First-aider can do in a case of this kind. We pointed out in Chapter II. that the brain was closely encased in the skull (Cranium); and therefore, if an injury results in the fracture of this, the brain case, the brain will necessarily be affected, and it depends very much on the extent of the injury as to whether the sufferer will recover or not. It is very difficult at times to diagnose the injury, but one thing is highly probable—the patient will be insensible (but not always so). There may also be bleeding from the mouth, ears, or nose, and sticky fluid may be discharged from the ears; also there may be symptoms of concussion of the brain. Medical aid must be requisitioned at once.

In such a case especially, but at all times when treating an

accident in the streets, WE MUST SEE THAT THE CROWD DOES NOT PRESS AROUND THE PATIENT; plenty of air is needed. Seek the aid of the police for this purpose if possible. Thanks to the teaching of the great Ambulance Associations, particularly the St. John and St. Andrew's Associations, vast numbers of the police are now instructed in "First Aid to the Injured," and therefore it is probable that the constable would prove doubly useful.

The patient must be placed in a lying-down position with the head slightly raised. Loosen all tight clothing to render the breathing easier. If there should be bleeding from a wound, a temporary dressing should, if possible, be gently applied to stay the hæmorrhage. If an ambulance waggon or litter can be obtained, have the patient removed home if his address can be traced—if not, to the nearest hospital. If the patient is removed to the hospital, First Aid is at an end; but if he be taken home, and medical aid cannot be obtained at once, then place the sufferer very carefully on a bed or sofa IN A DARKENED ROOM. Prevent any talking, and *see that all is kept quiet*. Apply cold to the head and warmth to the extremities, by which we mean cold wet handkerchiefs applied to the head, and hot-water bottles to the feet. Have the bottles wrapped in flannel to prevent burning, and, failing bottles of hot water, hot bricks sufficiently wrapped up will do. NO STIMULANTS MUST BE GIVEN, but smelling salts should be applied to the nostrils.

FRACTURE OF THE NOSE.—This is an accident, the result of which will require medical aid; for if this appendage is not properly set, it will entirely alter the facial expression. The First Aid treatment consists in stopping bleeding which comes from the nostrils, and any wound that may have been inflicted.

FRACTURE OF THE LOWER JAW.—This is usually occasioned by direct violence, a blow, or by falling on the chin (*see* Fig. 116). The patient will be unable to speak distinctly, and should be told not to attempt to speak. If the fingers are passed along the chin the seat of fracture will be felt, and probably crepitus, or grating of the ends of the bone, will be heard. There will be bleeding and dribbling from the mouth.

To deal with such a case, place the jaw gently in a natural position.

If only one handkerchief is at hand, fold the same and place the centre of it over the chin; carry the ends up and tie well back on the top of the head in a "reef-knot" (*see* Fig. 78). If, however, two handkerchiefs can be obtained, fold and place the centre of the second over the chin, well to the front; take the two ends round and tie them at the back of the neck.

If we have a triangular bandage, we must fold it narrow, place the centre over the chin; carry one end up and over the head, well back, and cross it with the other end over one of the ears; then bring the ends round, one across the forehead and the other round the back of the head, and tie it over the other ear (*see* Fig. 72); this will keep the bandage on the jaw in the proper position. The best means of treatment is by applying a four-tailed bandage (*see* Figs. 100 and 101—Roller-bandaging). Medical aid must be obtained quickly, as a deformity in the jaw is a great disfigurement.

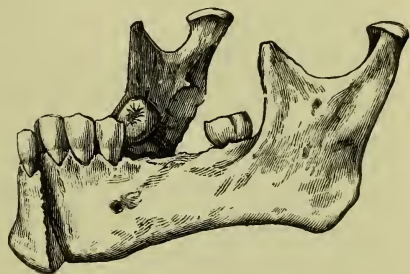


FIG. 116.—FRACTURE OF JAW.

FRACTURE OF THE SPINE or VERTEBRAL COLUMN.—This is another

accident in which a First-aid-er can do very little. If it should be high up the column, the neck is broken and death ensues. We must not push the arms under the patient, but try and pass a blanket or rug under and lift him, very steadily, just sufficient for a stretcher or something to be placed under, on which he may be conveyed home or to the hospital. If the patient be in a state of collapse and medical aid has not arrived, we must try to restore him (*see* p. 167). If from the nature of the accident the back appears to be injured, or broken, it will be our duty to see that any lifting that may be attempted is carried out in a most careful manner; even the slightest movement is likely to cause greater injury. If medical assistance can be summoned at once, do not attempt the removal of the patient, but wait and obey the doctor's instructions.

FRACTURED RIBS.—This is the result of accidents which are of common occurrence. A kick, blow, or a tumble may cause such. Undue pressure from behind, when leaning over a sharp-edged table or

railings, is sufficient to fracture the ribs. Squeezing in a crowd is also dangerous.

The patient will complain "that it hurts him to breathe," and will hold his hand to his injured side. This pain is caused by the sharp ends of the broken bone penetrating the lungs. A fracture of this kind can be easily discerned and crepitus heard, by passing the hand over

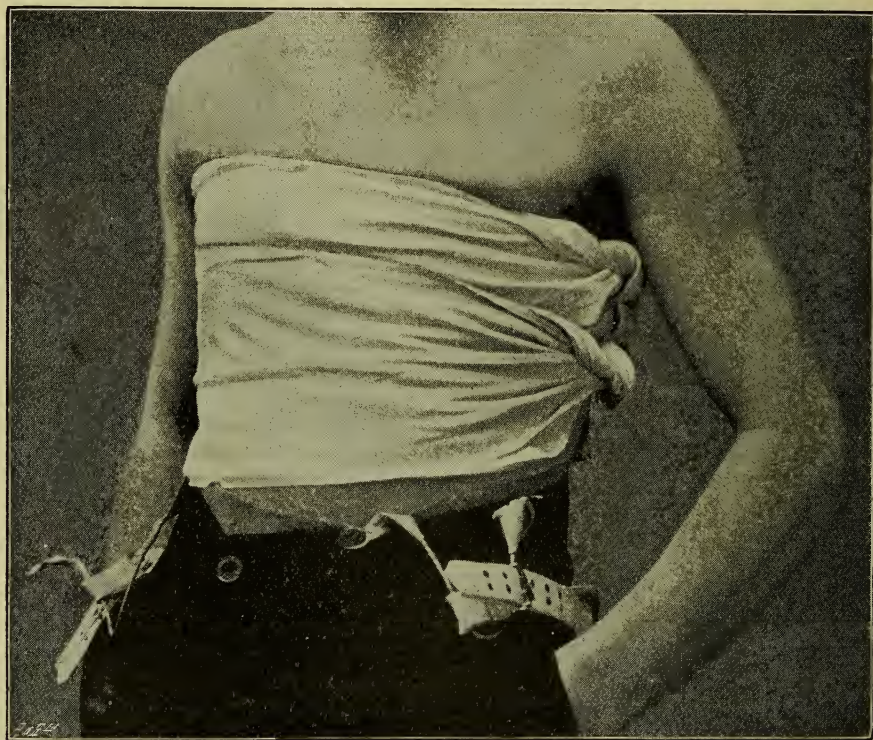


FIG. 117.—TREATMENT OF FRACTURED RIBS.

the injured side. There is no necessity to strip the patient. If not witnesses of the accident (1) ask the cause; (2) ask the patient what he feels. Should he point to the side and complain of catchy pain when breathing, we may be sure he has fractured his ribs.

Fold two triangular bandages broad and pass them round the trunk, with the centre of each on the fractured side, and tie firmly on the opposite side. Let one bandage overlap the other at the seat of the fracture (*see* Fig. 117).

If the ribs are broken on both sides it is better not to apply bandages, or if they are broken only on one side and the patient should complain of greater pain after the bandages have been applied, remove them and keep the sufferer as calm and quiet as possible. Should there be any blood-spitting, which there may be if the lungs are injured, the blood will be bright red. Give ice to suck, and failing ice, sips of cold water will do.

FRACTURE OF THE CLAVICLE or COLLAR-BONE.—This is a very common accident (*see* Fig. 118). It is usually produced by indirect

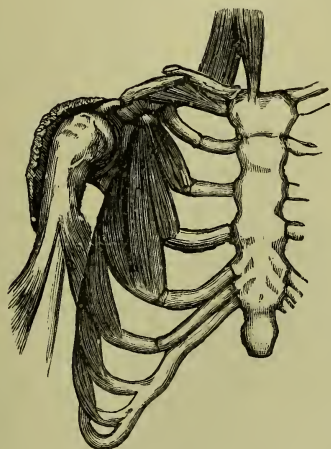


FIG. 118.—FRACTURED CLAVICLE.



FIG. 119.—FRACTURED HUMERUS.

violence; we may fall heavily on the hand and fracture the collar-bone (Clavicle). The shoulder will drop and the patient will at once try and support it by grasping the arm and pushing it upwards. You may feel the fracture by passing the fingers along the bone.

In such a case make a firm pad of soft material about the size of the fist, and place it in the *AXILLA* or arm-pit. This done, place the arm in a large sling supporting it well. Then fold a broad triangular bandage and pass it over the injured arm and sling, and tie it on the opposite side of the body, thus securing the arm to the side (*see* Fig. 109). In passing it over the injured arm do so near to the elbow. It will then be a better lever, with the pad in the armpit to draw the fractured ends of the clavicle into position.

If no bandages are at hand, towels will be very useful. In this case

having made a pad and placed it in the arm-pit, pass one towel over the elbow of the injured arm and tie it on the opposite shoulder; then secure the limb, including the elbow, forearm and hand to the trunk with the other towel.

The patient having undergone such First Aid treatment, may be

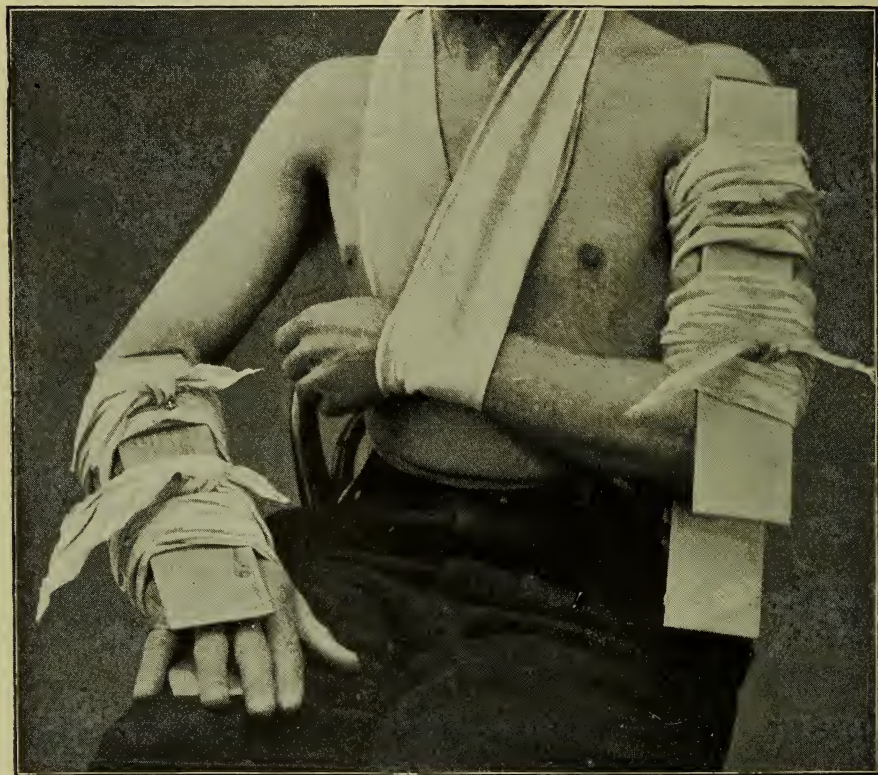


FIG. 120.—TREATMENT OF FRACTURED HUMERUS AND SPLINTING OF FRACTURED FOREARM.

removed any distance without fear of further injury or compound fracture.

FRACTURE OF THE ARM-BONE or HUMERUS.—The usual signs of fracture will present themselves, and the arm will hang helpless to the side. When the humerus is broken, the two ends overlap each other (see Fig. 119). This is caused by muscular action. It is important that a First-aider should remember this when putting the arm in a sling. If



FIG. 121.—FRACTURED RADIUS.

four narrow splints can be obtained, they can be placed carefully on the four sides of the injured limb. If, however, only two splints are obtainable, then place them as shown in Fig. 120. Fold two narrow triangular bandages, fix the upper ends of the splints first,

then gently adjust the arm to its natural position, flexing the elbow, and fix the lower portion of the splints with the second bandage. This done place the wrist-joint in a small arm sling, as shown in Fig. 120. Tie the sling over the uninjured shoulder. It is dangerous to put the arm in a large arm sling when the humerus is fractured. If this is done, pressure is put at the elbow, which will cause the ends of the bone to further overlap, and perhaps very serious damage may ensue.

The FLOWER-POT SPLINT (*see* Fig. 114) is useful in a case of fractured, humerus. Newspapers or brown paper folded round the arm will make a splint. Handkerchiefs will take the place of bandages, and a necktie or braces will make a sling.

If the patient is conscious, and only a short journey is to be made, it is better he should walk and not be shaken about in a vehicle.

FRACTURED FOREARM.—There will be the usual signs of fracture and generally it may be felt. It matters little to the First-aid-er whether both bones or only one is broken, as the treatment is the same.

When one bone only is broken it is more difficult to ascertain the nature of the injury. If the fracture cannot be felt, a little gentle pressure of the two bones together will cause pain, and this is sufficient to tell the tale to an experienced person. The second bone will act, so to speak, as a splint. This may be seen in Fig. 121. If both bones are fractured the break is plainly discernible, as is shown in Fig. 122, where the Radius and Ulna are broken near the wrist.

The position in which the arm should lie when

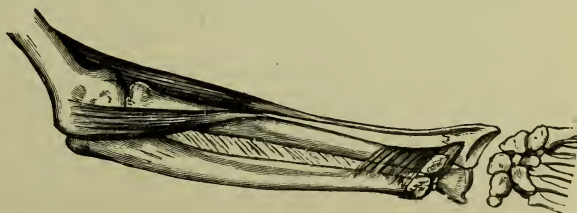


FIG. 122.—FRACTURED RADIUS AND ULNA NEAR THE WRIST.

splinted, is this:—The elbow must be flexed or bent, the forearm lying across the chest with the hand, palm inwards, thumb upwards. The hand must be a little higher than the elbow. A splint, long enough to extend from the elbow to the tips of the fingers, should be placed on the side next to the body, and one reaching from the elbow to the wrist on the outside (see Fig. 120). Secure the ends of the splints near the elbow first, then carefully adjust the limb, and secure the other ends. This having been accomplished, put the arm in a large arm-sling, taking in the elbow. The forearm, when fractured, requires supporting its whole length. Should the patient meeting with this accident be wearing a frock or long coat, the front end may be taken up over the shoulder and pinned.



FIG. 123.—FRACTURED FEMUR.

FRACTURED WRIST.—Put the wrist and hand palm downwards, on a flat splint, which has been padded, and secure the same with a bandage or handkerchief. Then place the limb in a large arm sling.

FRACTURED FINGERS.—If more than one finger is broken, a padded splint, as for the wrist, is best. If one finger only is damaged, put a narrow slip of wood under same and bind it round with strips of linen (miniature bandages). In either case put the arm in a narrow arm sling, and keep the hand higher than the elbow.

Having dealt with fractures of the head, trunk and upper limbs, we now have to consider those affecting the lower limbs. We explained that in the case of fracture of the upper limb, if the patient was able, it would be better for him to walk, if near the doctor or home. But in cases of fracture of the lower limb, the patient must, of course, be carried or conveyed by some means. We shall deal with this subject in another chapter.

FRACTURE OF THE PELVIS or HAUNCH-BONE.—A fracture of this nature is very dangerous, and even though the patient says he can



FIG. 124.—FRACTURED THIGH SECURED BY SPLINTS AND BANDAGES.

walk, ON NO ACCOUNT SHOULD HE BE ALLOWED TO DO SO, as there is frequently some severe injury to the internal organs. A fractured pelvis is generally caused by being run over, but a fall—say, from a high wall—is sufficient. Railway men receive this injury sometimes by getting crushed between the buffers of trucks or carriages.

Some broad, soft material—say flannel—if passed round the pelvis, will afford relief. Great care must be exercised in handling a sufferer from such injuries. The patient must be removed home or to the hospital as quickly as possible, on a stretcher or something flat. He had better be lifted by passing a rug or blanket under him, and then placed with the blanket on to the stretcher. Medical aid must be obtained at once, as an accident of this kind is very critical.

FRACTURE OF THE FEMUR or THIGH-BONE (*see* Fig. 123).—If we should not happen to be present at the time of the accident, there are signs which will point out clearly what has occurred. If the patient is lying on his back, one leg will be shorter than the other, and the foot of the shorter one will lie over: that is, the outer border (little toe side) will touch the ground. If we lie on the back, the toes point upwards and outwards; if, however, the Femur be broken, the foot on that leg will turn outwards, touching the ground.

In order to prevent the jagged ends of bone doing further injury, it is necessary to secure the whole of the body on that side in a rigid position. To do this, if possible, we must get a splint long enough to reach from the armpit beyond the foot, and if we have sufficient triangular bandages, they must be used as follows (*see* Fig. 124), all of them folded narrow.

1. Place a bandage under the shoulders, and bring it across the chest; then twist it round the top of the splint near the armpit, to prevent the same moving. *Fix the bandage firmly*, and tie this and the following bandages in “reef-knots” on the splint.

2. Round the haunches.

3. Above the seat of fracture, high up in the groin.

4. Below the seat of fracture, above the knee.

5. Below the knee.

6. Above the ankle.

7. Tie the feet together by passing a bandage, folded narrow round the splint and ankles of both feet, bring both ends to the front, cross

them and pass them under the feet; bring them both to the top again and tie over the insteps.

On no account lift the limb about when applying bandages, but pass the bandages under the hollows at the hip, knee, and ankle, and then work them into position.

If a bandage is passed round both legs *below* the knee, and the feet bandaged together as described above, this will bring the sound limb into use as a splint. In the illustration parts of a set of splints are used, but a good firm piece of wood, extending the whole distance, would be better. A broom-stick, rifle, or billiard cue will make capital splints for a thigh-fracture; if, however, these are not at hand, the First-aider must search for something long enough to serve the purpose. A short splint can be put on the inside of the limb, but if a good stout outer splint can be obtained, a short inner splint is hardly necessary. An umbrella, walking-stick, or even paper folded will make a short splint.

The foregoing instructions show that a number of bandages are required to secure a fracture of the thigh, and it is not at all likely, when such an accident occurs, that we shall have them with us. **LEARN TO IMPROVISE**; this is the great characteristic of a good First-aider.

FRACTURE OF THE PATELLA, or KNEE-CAP.—This sometimes occurs through falling heavily on the knee, or it may be created by muscular action. In sports and games, such as tennis, football, and cricket, or running down hill, one is apt to try and save a fall forwards by throwing the body backwards. This is a great strain on the muscles, and has often caused fracture of the patella. The fracture can be easily felt.

The First Aid treatment of such cases is to apply a flat splint extending the length of the leg, underneath the knee, binding the leg to the same with bandages. **THE LEG MUST BE KEPT STRAIGHT.**

A triangular bandage may be folded narrow, and applied in a "figure of eight" method to the injured patella. Lay the centre of the bandage above the broken bone, pass the two ends round the limb and cross them; bring them to the front and cross them below the Patella, after which take them round the limb and tie in a "reef-knot." Securing the leg straight on a splint, and tying both legs together, is really sufficient for First Aid assistance. The patient must then be removed home or to a hospital, on a stretcher.

FRACTURE OF THE LEG (*See* Fig. 125).—In fractures of this portion of the lower limb, both bones (Tibia and Fibula) are usually broken. It may occur from a wrench, such as catching the foot in some palings when falling, or from a severe blow or fall. Jumping, a carriage accident, or being run over by a vehicle, often result in this injury.

As in the forearm, it is easy to discern the fracture of the leg when both bones are broken. If only one bone is broken the patient will complain of pain in the limb, and should we proceed to examine the limb we must do so very carefully. If we are uncertain upon the point, it is better to treat it as a fracture, and leave it for the surgeon to decide. If the Tibia, or shin-bone, is fractured, it requires the very greatest care to prevent a compound fracture. This bone can so easily push through the skin, therefore we must do our utmost to keep the patient quiet. This is one of those cases when the friends of the injured person are most anxious he should try and walk, or some other equally absurd suggestion is made; but we must be firm, and forbid any such thing being attempted.

Place a splint on the outside, and another on the inside of the leg, and secure the limb by bandages or handkerchiefs (*see* Fig. 126), putting the one near the knee on first. Then adjust the limb to its natural position, gently pulling it, with the foot upright. Splints may be put on outside the clothing, and there is no occasion to examine the limb carefully, unless the fracture is compound and there is bleeding. It can soon be perceived that the leg is broken, and then we need not examine the injury more, or we shall probably do further damage. The flower-pot splint (*see* Fig. 114) may be applied to the leg equally as well as to the arm, or a coat (*see* Fig. 115), and, indeed, almost anything that is the required length, and flat, will answer the purpose.

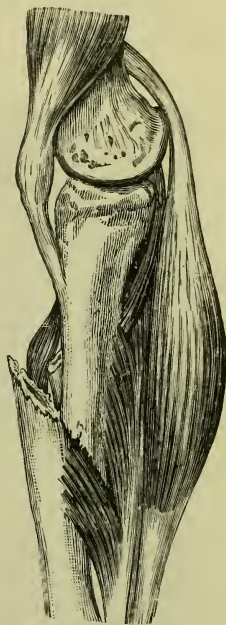


FIG. 125.—FRACTURED LEG

A POTT'S FRACTURE AT THE ANKLE JOINT.—This is depicted in Figs. 127 and 128. There is great deformity, as may be seen in Fig. 127. The boot must be cut away if we can do so without creating great pain, or causing the fracture to become compound, and a splint applied

from the knee downwards, on the side the deformity will allow. Adjust the foot very gently, as far as possible, to its natural position before securing the lower end of the splint.

We shall bring this chapter to a close by giving a brief outline of the course to be followed in treating a compound fracture.

COMPOUND FRACTURE.—We have been dealing so far with *simple* fractures, which involve only the breaking of a bone or bones. In

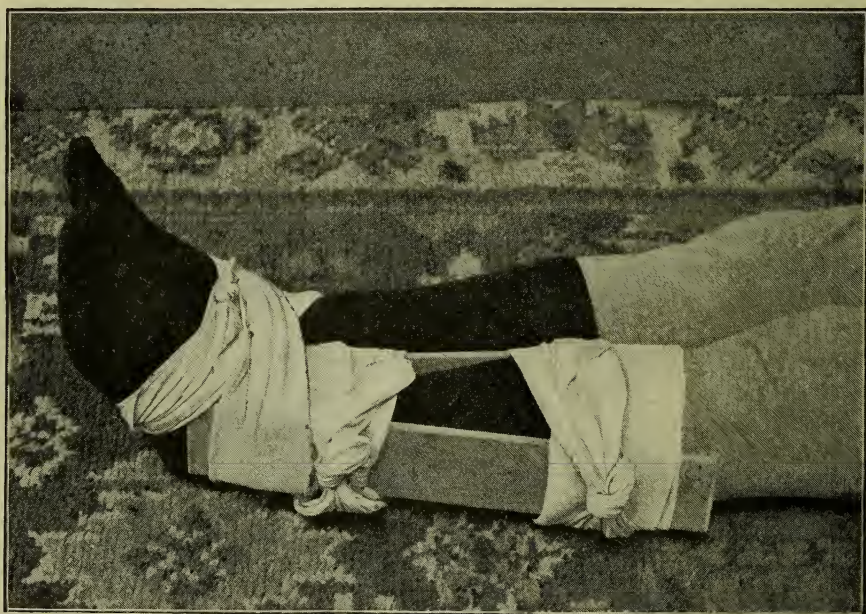
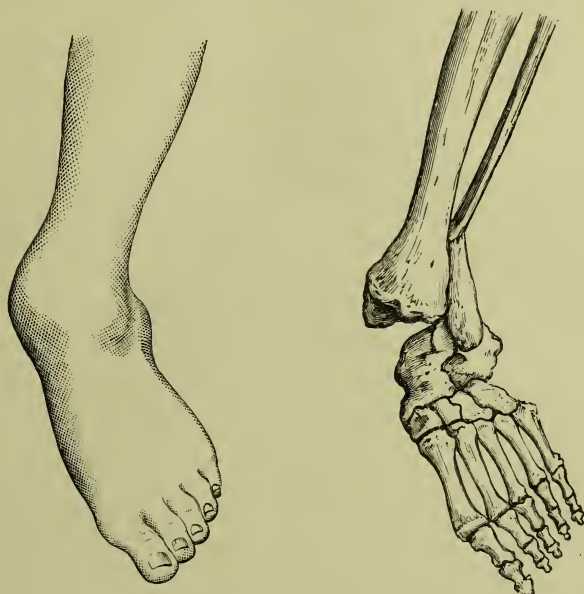


FIG. 126.—TREATMENT OF FRACTURED LEG.

compound fractures we have a much more serious case to deal with. The first thing to do is to cover up at once any projecting bone, as exposure to the air may lead to bad results. There may be hæmorrhage, and we should then have to stop the flow of blood before rendering any other aid. Perhaps a very ugly wound has to be cleansed, after which we have to put on an antiseptic dressing (see Chapter on Wounds, page 62). Whilst doing all this we must see that no further damage ensues. Then we proceed as we would in a

case of simple fracture. Let us not forget to be calm ourselves, and do all we can to assure our patient.

The following points regarding fractures and the rendering of temporary aid should be well laid to heart by all wishing to bring their knowledge to a real and valuable issue.



FIGS. 127, 128.—POTT'S FRACTURE.

1. Our duty is to prevent further injury, to reassure the patient, and to arrange means of safe transport.
2. SIGNS :—
 - Loss of power below the injury.
 - Unnatural mobility or movement.
 - Shortening of limb.
 - Pain and swelling at seat of injury.
 - Distortion or unusual appearance.
 - Crepitus, or grating of jagged edges.
3. CUTTING CLOTHING.—Cut up the seams. There is no necessity to destroy clothing.
4. REMOVING CLOTHING.—It must be taken from the uninjured side first.
5. REMOVING BOOTS.—If elastic sides, then cut the elastic. If laced boots, cut the laces.

6. SPLINTING.—Fix the upper end of the splint or splints first, and then gently adjust the limb before fixing with the second bandage.
7. BANDAGE KNOTS.—Should be tied on the splints.
8. FRACTURED HUMERUS.—Place in small arm-sling, as pressure at the elbow may create further injury.
9. FRACTURE OF THE ARM.—Always place in a sling, after splinting. When flexing, or bending, the arm, see that the hand is higher than the elbow.
10. COMPOUND FRACTURE.—Treat the injury; cover any projecting bone, and stop bleeding before splinting.
11. SENDING FOR MEDICAL AID.—Write down particulars of case.
12. Do not get excited. Act very gently and quickly, not only in rendering First Aid treatment, but also in the management of transport and all matters prior to handing the patient over to the doctor's care.

CHAPTER XI.

RESPIRATION OR BREATHING.

IT is very necessary that a First-aider should have some knowledge of this most important subject. Our existence would not be possible without drawing breath. Respiration is the means of purifying the blood. Each time we breathe, two distinct movements take place, INSPIRATION and EXPIRATION, the former the breathing in, the latter the breathing out. In the chapter on HÆMORRHAGE it was explained that the blood, after passing through the arteries and capillaries, was returned to the lungs to be purified. At each inspiration of breath, oxygen is supplied to the blood, and at each expiration, carbonic acid gas is given off. The result of this new supply of oxygen is seen in arterial bleeding, when the blood is of a bright red colour. After passing through the capillary system, that which oozes from a wounded vein is of a dark purple colour, and is then charged with carbonic acid gas, given off from the waste tissues of the body. So it can be understood that without the function of breathing we could not live, as the blood would be of a poisonous nature. In breathing a pause takes place, both after inspiration and expiration; that after expiration is the longer, as it takes a greater time for the air to pass from the lungs than it does to admit the same. It is well to mention here that the skin assists in respiration. The great muscular action in respiration is performed by the DIAPHRAGM (or Midriff). This increases or lessens the depth of the chest, as it rises and falls, but the walls of the chest also expand by means of the INTERCOSTAL muscles, lying between the ribs. When the ribs expand, the breast-bone is forced forward; so in inspiration, the diaphragm contracts and becomes flat, the ribs expand and force the breast-bone forward, and thus we get an increased space in all directions. In expiration the diaphragm arches itself upwards, the ribs and breast-bone fall and the space is diminished, and so the air is expelled. It will thus be seen that the chest-wall is similar in action, by its expansion and depression, to a pair of bellows.

We have two passages in the throat; one, the *ŒSOPHAGUS*, or gullet, down which the food passes, and the other, the *TRACHEA*, or windpipe, which takes the air to the lungs. It is with this latter we now have to deal.

Breathing is an involuntary action; we have not to remember to breathe. If we hold our breath there is great discomfort, and a desire contrary for the moment to the will.

The air inhaled becomes warm as it passes the various passages on its way to the lungs. This takes place principally in the nasal cavities. The air-passages are as follows:—The nose, mouth, larynx and the trachea. The larynx we can feel in the throat, which is also the voice-box (*see* Fig. 35), it is commonly called “Adam’s Apple.” When swallowing food, the larynx is covered by the *EPIGLOTTIS* (a lid covering the aperture of the windpipe). We occasionally hear the expression, “Something has gone the wrong way,” this is when food or liquid has managed to pass the epiglottis, which a cough will generally expel.

The trachea (windpipe) (*see* Fig. 35), branches off into two tubes known as the *BRONCHI*, which afterwards become numerous small vessels, commonly called the bronchial tubes; they then become still smaller and are called bronchioles, which give the tree-like appearance depicted in Fig. 35.

If anything gets lodged in the larynx, or below it, an operation has to be performed called *TRACHEOTOMY*. This consists in an incision being made in the trachea. In diphtheria the opening in the larynx is apt to get closed up by the false membrane which the disease brings about.

The air now reaches the most important organ of respiration, the lungs.

These two bodies are spongy in appearance and fit closely to the ribs, filling to a great extent the chest cavity (*see* Fig. 129). They are enclosed in a sac (purse-shaped cavity), termed the *PLEURA*. The lungs consist of a large number of air-cells which are grouped round the smallest air-tubes (bronchioles). We do not part with all the air these cells contain, but only a small portion of it, and the air which passes in and out is termed *TIDAL AIR*. The walls of the air-cells composing the lungs are extremely thin, and so are those of the innumerable capillaries surrounding them. Thus the impurities of the venous blood are given off to the air remaining in the cells, and this is mixed with the tidal air and breathed out of the body. Pure air is taken to

the air-cells, and its oxygen is taken up by the capillaries and circulated in the system.

This fact proves how necessary *it is to have a well-ventilated room*, especially when a number of persons are gathered therein. They are all breathing out carbonic acid gas, and the air of the room will soon be charged with this noxious vapour. All dwellings should be properly ventilated. Those who toil in workshops should have this provision made for them, as it is most important that the health should be studied in order that work may be properly carried out. It is also

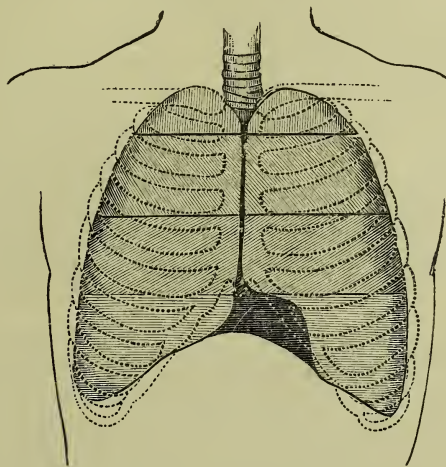


FIG. 129.—LUNGS INFLATED.

very necessary that the sick-room should have a sufficiency of fresh air; this is a great First Aid step in illness.

The nose is the proper breathing apparatus, as it is lined with the means of heating the air as we inhale it. In cold weather it is really dangerous to breathe through the mouth. Bronchial affections are brought about by so doing. Children, and especially babies, should not be allowed to cry much out of doors in the winter. This is frequently the cause of many distressing illnesses. We cannot be too particular in seeing that the young play and work where the air is good. If the blood functions are not carried out properly—that is, if they do not take in sufficient oxygen in breathing, the health is soon undermined. We should remember that “the boy makes the man,” and proper attention given to the young will enhance the race. British people should see that those who are to carry on the noble traditions of the

nation are given that bone and sinew so necessary to enable men and women to carry out the duties of life in a manner creditable to their King, their country and themselves.

ASPHYXIA: DROWNING AND SUFFOCATION.—Suffocation is caused by the blocking of the air passage to the lungs. As we cease to breathe, the blood cannot throw off its impurities and take in a new supply of oxygen. The venous blood becomes congested, and the heart very soon ceases its work. ASPHYXIA is the name given to this condition of the body. Asphyxia may be brought about by various means, such as strangulation or pressure on the air passage, choking, drowning, smothering, or by inhaling poisonous gases.

The most common form of asphyxia, however, is by drowning. We often hear such an expression as "It's not deep enough to drown anyone." This is a mistake, because if a person desired to commit suicide by drowning, he can do it even in a puddle. All that is required is to immerse the nose and mouth in water.

In drowning a person who is immersed may sink and rise again to the surface several times. When at the surface air is breathed in, but ultimately the action of breathing takes place under water, and then the air passages become full of water and its additions, and some goes to the stomach. Thus the person becomes asphyxiated and apparently lifeless. The face gets swollen, livid or blue, which increases as the congestion of the blood proceeds

THERE IS NOT A MOMENT TO LOSE. — We must not attempt to think of the symptoms, since we can see at a glance what is the matter. The great point for a First-aider to remember is that the heart's action does not cease at once, and therefore there is always the chance that a spark of life remains; and this being so, every effort should be made to restore breathing. The means to be employed are termed:—

ARTIFICIAL RESPIRATION.—There are various methods, which we will endeavour to explain. But, before using any of them the body must be turned over with the face downwards, the stomach raised to a higher level than the mouth by placing a roll of clothing or something



FIGS. 130 AND 131.—ARTIFICIAL RESPIRATION.

under it. This being done, if pressure be put on the groin the water in the stomach will be expelled. Then turn the body face uppermost in order that a free passage may be established for inspiration and expiration of air. All light clothing next the chest must be removed, the mouth must be cleansed and any obstruction removed from the nostrils. The tongue should be pulled forward and if possible secured by putting an elastic band across it and under the chin. If not, get someone to hold the tongue forward with a handkerchief. This is a better plan than the elastic band. See that the handkerchief does not get into the mouth, or in any way prevent air from entering freely.

THESE OPERATIONS MUST BE PERFORMED VERY QUICKLY and artificial respiration proceeded with *at once*, or there will be no chance of restoring breathing. Supposing the person is still breathing, when taken from the water it is as well to cleanse the mouth and eject the water swallowed as directed above. If the breathing should be very feeble it is a good plan to slap the bare chest with a towel soaked in cold water; this may restore breathing to its full vigour.

The three best known methods of artificial respiration are:—1. Dr. Sylvester's; 2. Dr. Marshall Hall's; 3. Dr. Benjamin Howard's.

Dr. Sylvester's is the method principally adopted in Great Britain, and Dr. Howard's is the one most approved of in the United States of America.

DR. SYLVESTER'S METHOD.—Lay the patient on his back, and if an assistant be at hand, he should extend the legs, putting the feet together and holding them in position. On no account allow a crowd of people to stand round; plenty of air is very necessary. The operator must roll up a coat or something soft, and place it under the patient's shoulders in order to slightly raise them. The head will then fall well back, and this will keep the air passages open. Then kneel at the patient's head (*see* Fig. 130), grasp the arms near the elbow, and carry them with a steady circular motion outwards and backwards over the head as far as they will go (*see* Fig. 130), in order to expand the chest. Pause awhile and count two, then with a similar circular motion carry the arms down to the side with the forearms crossed over the pit of stomach, lean forward and press firmly (*see* Fig. 131). This will push the diaphragm upwards and so expel the air. When pressing a grunt will be heard if air has entered the body. Keep the process up at the rate of fifteen or seventeen times per minute, until breathing commences

or a doctor pronounces life to be extinct. The breathing will begin with short gasps; take no notice of this but keep steadily on with artificial respiration until the breathing is natural.

Whilst the process of artificial respiration is going on, the assistant or a bystander may dry the feet, and if any dry clothing can be obtained the wet may be removed and replaced by dry. In doing this he must not interfere with the operator.

When breathing has been restored watch the patient very carefully, as "shock" is sure to be present in more or less severity, and the patient may have a relapse, and it will then be necessary to at once proceed again with artificial respiration.

When assured that the breathing is natural, use friction, in order to help the circulation of the blood. This is done by grasping firmly and rubbing the limbs upwards. Friction should not be applied when the limbs are exposed, cover them with a blanket, or if able to dry the limbs and put on dry clothing, the rubbing may be done over the clothes. If warm flannel can be obtained for rubbing the limbs this is better. The remainder of the treatment is embodied in that for "shock" (*see* p. 167).

DR. MARSHALL HALL'S METHOD consists of laying the patient face downwards, with a roll of clothing or something soft under the chest. The weight of the body and pressure on the back with the hand will compress the air out of the chest. Then turn the body on its side, by catching hold of the shoulder and hip. This will expand the chest and admit the air. It is not so good a method as Dr. Sylvester's because only one lung is free to take the air, the other one being compressed by the weight of the body.

DR. BENJAMIN HOWARD'S METHOD is as follows:— Turn the patient face downwards with a roll of clothing under the chest and stomach, and one of his arms under his forehead to keep his face from the ground. Then by pressing two or three times and keeping up the pressure with our own weight each time for a few seconds, the water will be expelled from the stomach. The body must now be placed face uppermost with a roll of clothing under the shoulder blades, and the head hanging well back. Then kneel across the patient and fix your arms to your sides, flex them at the elbow, and with the hands grasp the

sides of the patient's chest and slowly press forward with all your weight until the face is just over the face of the patient. Pause for two or three seconds and then with a jerk backwards release the chest. After two or three seconds' pause commence again. These movements must be performed about ten times a minute and be kept up for a considerable time.

Artificial respiration may be performed in the case of a young child in a similar method to Dr. Howard's, by simply placing the child on its back and pressing the chest by putting the hand over the centre of same, and then suddenly releasing the hand, the chest will spring back. By this means air is expelled and taken into the air-passages.

Efforts to restore breathing by artificial means should be *kept up for quite an hour*, or even longer.

The following may be cited as a good case, showing the importance of prolonging the efforts to restore breathing by artificial means.

"The Bradford Observer," September 4, 1894, speaking of the boating disaster at Morecambe, says:—"The rescued persons were taken with the utmost promptitude to the houses at which they were staying, with the exception of Miss —— and the two children of Mr. —— . These were taken to the Bath Hotel in Northumberland Street, where for three hours Miss ——'s life hung in the balance. The police constable, inspector, and a boatman worked at the Sylvester method of artificial respiration for the whole of that period, and laboured without cessation while the perspiration poured down their faces. Eventually they had the satisfaction of restoring consciousness, and the medical gentlemen spoke in the highest terms of their work."

The following points must be grasped in order that we may be qualified to act in a case of asphyxia from drowning.

1. Set to work instantly and undo the clothing at the neck.
2. Get what water we can from the body by the means set forth.
3. Cleanse the mouth and nostrils that the air-passages may be free.
4. If Sylvester's method be adopted, see that the arms take a good sweep outwards when taking them over the head and returning.
5. Make a distinct pause between inspiration and expiration, and *vice versâ*.
6. When feeble efforts to breathe are noticed, do not interfere, but go steadily on with the work.

7. Having restored breathing, help the blood in the veins to return by chaffing the limbs upwards.
8. Apply bottles of warm water or warm bricks, wrapped up, to the armpits and soles of the feet.
9. See that the patient is wrapped in warm blankets.
10. Whilst making sure that the body is kept warm, do not let the room be close. A person just restored requires plenty of fresh air to breathe.
11. Stimulants may be given, one of the best being hot coffee.

SUFFOCATION BY CHOKING.—Cases of this kind are often met with, and are certainly very alarming. The veins of the face and neck in this, and in other forms of suffocation, are distended, the patient is frequently insensible and convulsed, and the face has a blue appearance.

Generally a portion of food is the cause of choking, but sometimes other things are swallowed, especially by children, and occasionally we hear of adults swallowing their false teeth. We quote the following case from "First Aid," February, 1895.

"A rather alarming occurrence, and one nearly followed by a fatal result, took place a short time since. A passenger, while waiting for a train, was observed to stagger and fall down on the platform, and on the bystanders going to his assistance, he was found to be insensible. An employé at the station, who is an energetic member of the St. John Ambulance Brigade, was fortunately a witness of the accident, and immediately attended the man. Perceiving that the breathing was difficult and the face had become livid, he inserted his fingers into the mouth in order to draw out the tongue. To his surprise they encountered some hard, dry body at the back of the mouth, and managing to get hold of this, he withdrew it. It turned out to be a plate of false teeth, which had accidentally fallen to the back of the throat, and become impacted there. The patient speedily recovered, and after the arrival of medical assistance was able to proceed on his journey. There can be but little doubt he would have expired in a few minutes, had not this prompt 'First Aid' been rendered."

The first thing to do is to send for medical aid, if within call, in case the First Aid means should fail. Smack the patient well in the back, this may remove the obstruction. If not, put something between the patient's back teeth to prevent his biting, and then put a finger gently down one side of his throat, as far as possible over the base of the tongue, and try and clear the substance that is causing the harm away. This may cause vomiting, which will be useful. Do not push the finger down the throat hurriedly, or it may wedge the obstacle

tighter. If these means fail the doctor may have arrived, and he will have, perhaps, to perform tracheotomy—that is, he may have to open the wind-pipe to save life.

Severe inflammation may follow the swallowing of any hard substance, and this might choke a person. Send for medical aid, and apply a poultice on the outside of the throat, covering the *Pomus Adami*, or “Adam’s apple.” This will give great relief. In all cases of choking there is more or less shock, and this must be treated accordingly.

HANGING AND STRANGULATION.—In both these cases suffocation is produced by compressing the windpipe. A person found hanging must be immediately cut down and the ligature released; also in strangulation the constricting band must be removed from the throat. If the body is at all warm it is certain that breathing has not very long ceased. In both cases see that there is plenty of air around the patient. The clothing must be loosened at the neck, and also any belt or tightness anywhere. Dash cold water over the patient’s face, slap the chest with a towel dipped in cold water, and if this does not excite breathing, immediately proceed with artificial respiration.

SMOTHERING.—This is often created by mothers overlying their infants, and the bedclothes are often the means of smothering children. The simple form of artificial respiration—pressing the chest with the hand and suddenly releasing it—may be resorted to. Falls of earth on men, when excavating, will smother them. When they are extracted we should proceed with artificial respiration.

SWALLOWING FISH-BONES is alarming, but there is little danger, as they are usually removed and dissolved in a little time, especially if something coarse is eaten, or a liquid swallowed in gulps. The irritation set up will probably create the idea that the bone is still there. Should the bone be really fixed, medical aid should be at once sought.

Children and adults often swallow foreign bodies, which is due in a great measure to the foolish habit of putting things in the mouth. In such instances the danger is the possibility of their getting into the air-passages. Round substances are most likely to do this. If they should pass to the stomach, do not at once give a laxative, but

consult a doctor if possible; anyway, there is no need to administer any remedy of the kind indicated for two or three days. Give good solid food in order that the coin, or whatever it is that has been swallowed, may be covered in the stomach.

We now come to another form of suffocation, which is produced by the non-supply of oxygen to the blood. In other words—

BREATHING POISONOUS GASES.—Should a person be so placed that he cannot breathe the air sufficiently charged with oxygen, he will soon be suffocated. For instance:—

1. If a number of persons are shut up in a small room, without ventilation, they will be “overcome,” owing to a want of oxygen. In time they will be breathing in the carbonic acid gas which they have exhaled, and if they are not released, all will eventually be asphyxiated.
2. If a person sits in a room without ventilation, in which a coke or charcoal fire is burning, he will soon be suffocated.
3. If we inhale coal gas (ordinary gas, which we burn), this will produce death.
4. Men at times are suffocated in sewers, and while excavating wells, from a dangerously foul gas which is sometimes developed therein.
5. People are often suffocated from smoke.
6. By accident, or in the case of suicide, a person is killed by inhaling a large quantity of chloroform.
7. Choke-damp, which is such a source of danger in mines after explosions, also causes death.

In all the foregoing cases, should the person be asphyxiated, resort to **ARTIFICIAL RESPIRATION AT ONCE.**

There are, however, certain points of great importance to be remembered in dealing with these cases. **BE VERY CAREFUL NOT TO TAKE A LIGHT OR TO STRIKE A MATCH** when attempting to rescue a person suffocated by ordinary gas. Smash the windows for air, if there is any difficulty in opening them.

If a room is on fire, or full of smoke, tie a wet handkerchief over the nose and mouth, and then crawl into the room, keeping the face close to the floor.

To attempt the rescue of a person from a room in which he has

been suffocated with charcoal *is very dangerous*. Take a deep breath, and then, having covered the mouth and nose with a handkerchief dipped in vinegar and water, rush across the room and smash a window, and put the face to the aperture and breathe. If there are any other windows rush and break them, holding the face to the aperture in each case. Having done this the poisonous atmosphere will be dispersed, and the person may be carried out of the room.

If we have to rescue a person from a well, in which he has been overcome with gas, we must do our best to disturb the air in the well; and if we should descend to rescue, we must be secured by a rope and have a means of signalling. Before descending, cover the mouth and nose with a handkerchief dipped in vinegar and water, and give instructions that if the signalling ceases the rescuer must be drawn to the surface at once. A means of signalling can be made by a piece of thin cord running the whole length of the rope with which the rescuer is lowered. He must pull at short intervals in order that those that are at the surface, and anxious as to his safety, may know all is well.

CHAPTER XII.

INSENSIBILITY.

IT is of such common occurrence to find a person insensible, that it becomes the duty of anyone taking up seriously the subject of "First Aid to the Injured" to get a knowledge of the various causes to which insensibility is due.

The first thing we have to do in meeting a case of this nature is to find out the cause before attempting restoration. In this chapter we shall endeavour to make plain the details by which anyone will be enabled to distinguish the illness which produces insensibility.

In all cases, however, loosen the clothing at the neck and chest of the patient, and remove any tight restrictions, such as braces, belts, or stays. If any bystanders can give particulars, they may prove useful in helping to recognise the cause.

There are a certain number of persons going about who will feign insensibility in order to enlist sympathy and monetary assistance. In such cases there is generally some "kind friend" willing to receive any morsel of the latter we may be inclined to dispense. There is, however, no occasion to be duped in such matters, for we have only to lift the eyelid of the "sufferer" and touch the clear part of the eye and he will flinch from pain and turn the head to one side. If he should be really insensible he will not exhibit any sensation of pain when the eye is touched. If there should be a crowd standing round, their sympathies will be with the "sufferer," and someone is almost sure to go and obtain some brandy, which is just what was wanted by the "sufferer." We must not allow this to be given. A little rough treatment is all that is required, and if we can get a policeman to order him off, most probably we shall witness—as the writer frequently has—the pretender get up very hurriedly and run his hardest to prevent arrest.

There is no doubt that if we met such a scene as is pictured above, and any bystander should administer a dose of brandy, neat or diluted with a little water, recovery would be very rapid, especially if a

little money be handed to the "friend." We will now deal with the various conditions which bring about insensibility, commencing with the most simple form.

FAINTING.—The medical profession term this *syncope*. It is temporary suspension of the heart's action, and this is due perhaps to fright or fear. These cause a strain on the nervous system, and affect the nerves of the heart. Anything occurring suddenly, even joy, will act in the same way.

A person, usually a female, suddenly becomes pale, and the pulse is weak, and if we are not prepared she will fall to the ground. Sometimes, however, women have fainting symptoms, and will tell us that they feel faint. If we seat such a patient in a chair and draw the head downwards to the knees, and hold it there a few seconds, we shall find this will usually restore the sufferer. If this be not sufficient, we must place the patient in a recumbent position with the head low, unloosen all tight clothing, and free the neck. Then we should sprinkle cold water on the face, apply smelling salts to the nostrils, and, when the patient has recovered consciousness, we may give a dose of sal-volatile, or a little brandy. Eau de Cologne is very useful for applying to the forehead and temples. Keep the patient lying down for some time after she has recovered consciousness.

HYSTERIA.—A "fit of Hysterics" is met with almost as frequently as fainting, and it is usually the outcome of excitement amongst nervous females, but occasionally males suffer in the same way. A case of this kind will create a lot of commotion, as the patient generally makes a great deal of noise, grinds her teeth, and clenches her hands, and if we watch the face we shall perceive it is somewhat convulsed. It is a form of disease of the nervous system. A person about to have a "fit of hysterics" will probably place herself in a comfortable position, or should she fall, we shall probably find the fall has been broken by the arms of a gentleman.

Some people would describe a "fit of hysterics" as a sham. However, there is real cause for the same. As we have said, it is a disease of the nervous system, and at times the patient will become almost unconscious, but never entirely so.

If any sympathetic friends, ladies or otherwise, are near, they must

be told to leave the room. We must always keep one friend with us and be very firm with the patient. Let her know that we do not intend to have any nonsense. Get a glass of water and sprinkle it in her face, saying, "If you are not quiet, I will throw it all over you." This style of procedure will make the patient very indignant, and the effect will be speedy recovery. No sympathy must be shown for some time, or the patient will relapse into another fit of shouting, laughing, screaming, etc., and the neighbourhood will have all kinds of ideas as to the behaviour of your household generally. There is nothing more annoying to those around than this. The writer once witnessed such a scene, which commenced about 10.30 p.m. and continued till nearly 12.30 a.m. The whole neighbourhood was aroused. This long duration was entirely owing to the fact that the patient received sympathy on all sides, and no firmness was adopted or allowed.

EPILEPSY, or FALLING SICKNESS.—The patient is suddenly seized with a fit, throws up his arms, utters a scream, and falls instantly to the ground. Falling suddenly is very dangerous. The writer saw a young man walking along one of the busiest streets of the Metropolis, and when in the act of crossing the road, he was seized with an epileptic fit and fell instantly amidst the traffic. As if by a miracle he was not touched, and was carried into a doorway of a building near, and after treatment was assisted to his office. There is also another danger to a person suffering from these fits. He or she might fall into the fire, or against the fire, and be burnt.

The patient is not completely insensible, but will jerk his limbs very violently. There will be froth at the mouth, which is sometimes streaked with blood, the tongue having been bitten. The hands will be clenched tightly and the face livid. In such a case as this we must place the patient in a comfortable reclining position, with the head raised. Loosen the clothing at the neck, and put a piece of wood or something into the mouth, to prevent the tongue being bitten. Restrain the violent movements gently. Do not use force, but prevent the patient doing himself any injury by knocking his limbs against furniture or any hard substance. The sufferer will be very prostrate after the fit, and will probably have a prolonged sleep. He should not be left to go home alone. Do not refer to the fit afterwards, but should he speak of same, we must not dwell upon the matter, or the dread of giving trouble and creating a scene will, perhaps, produce another

fit. Epileptic subjects should not engage in sports or dangerous exercise. Epileptic fits are sometimes shammed by beggars. They put a small piece of soap under the tongue, in order to produce the frothing at the mouth, and by holding the breath they make the face livid in appearance. If a case has this appearance, gag the mouth and search for the soap.

APOPLEXY.—A fit of this kind is dangerous, and is caused by the bursting of a blood vessel on or in the brain.

The symptoms are as follows:—The patient will fall down insensible. The face will be flushed and probably drawn on one side, the breathing will be heavy, accompanied by snoring and puffing out of the cheeks (the proper term is stertorous breathing). If we lift the eyelids and examine the pupils of the eyes, we shall probably find them unequal (the pupil means the black spot in the centre of the eye). One will be dilated (larger), and the other will be its normal (ordinary) size. The body will be paralysed on the opposite side to the apoplexy, that is to say, if the clot of blood or burst is on the right side of the brain, the paralysis will be on the left side of the body. This is due to the nerves crossing in the Medulla Oblongata (*see* page 21). Although the patient is insensible, we can easily distinguish a paralysed limb from one in its normal condition. Remember, in apoplexy the patient cannot be roused.

It is very important that policemen should have a knowledge of the symptoms of apoplexy, because a person may have a seizure of this kind at any minute. An elderly man may have had only one glass of whiskey and water, and very shortly afterwards fall in a fit in the street. We wonder how many times the police have come on such a scene, and because of the smell of spirit have removed the sufferer to the police station, and he has been put in a cell pending trial for drunkenness in the morning. The poor fellow dies long before this from an apoplectic fit, whilst the police were naturally thinking that he was sleeping the drink off. Great sorrow would be caused, and all through the absence of a slight elementary knowledge. Thanks to the teaching of the great Ambulance Associations the police in this country are gaining a knowledge which will prevent such occurrences. The City of London Police Force is a fine example of this. Every man in the force is trained, and this should be the case throughout the whole police force of the country.

A case of intoxication differs largely. There is no paralysis, the pupils of the eyes will be equal, the patient may be roused, there will probably be much vomiting, and if we pinch a limb the patient will flinch. It is best for a First-aidier to give the benefit of the doubt, and treat a case as apoplexy, if he is uncertain, in the following manner:—

1. Send for medical aid.
2. Loosen the clothing at the neck and chest.
3. If the patient has to be carried home on a stretcher, the head must be higher than the feet.
4. Put the patient on a bed with the head slightly raised, and darken the room by pulling the blinds down.
5. Apply cold to the head and back of the neck—ice or cloths wrung out in cold water. If the latter are used change them frequently.
6. Apply hot water bottles, wrapped up in flannel, to the feet.
7. Do not give a stimulant.

INTOXICATION.—A person suffering from the influence of drink, or, as it is termed, **ALCOHOLIC POISONING**, may be said to be in a very dangerous state and should be watched. Both pupils of the eyes will be dilated (larger) and the clear portion will be sensible to touch. We are speaking of a serious case. There will be no paralysis. If we lift the limbs there will be some resistance. The patient should be put to bed in blankets, and hot water bottles wrapped in flannel should be placed at his feet. In an ordinary case an emetic (a tablespoonful of salt, or a teaspoonful of mustard in a tumbler of warm water) may be given, or the patient be left to sleep off the effects.

OPIUM POISONING.—This is brought about by eating or smoking opium, or by taking an overdose of anything containing same, such as: Laudanum, chlorodyne, and some cough lozenges. The person will become drowsy, and if we attempt to wake him up he will beseech us to leave him alone, which we must on no account do. We may come across a case where the patient is already getting insensible. Look about the room or search the patient's pockets, and probably we shall find a bottle or something which will give us a clue. If opium poisoning, the pupils of both eyes will not be larger than a pin's head. They are referred to as "pin-hole pupils." Both sides of the body will

be alike. We must at once give an emetic—a tablespoonful of salt or a teaspoonful of mustard in a tumbler of warm water. Failing these remedies give a quantity of warm water, or tickle the back of the throat. The patient will then vomit some of the poison, but still a certain amount will have entered the system, and this we must counteract by preventing the patient from lying down or trying to get to sleep. If we can get assistance, march him up and down in the open air, smack his back and arms with a wet towel, and throw cold water in his face. Give strong coffee at intervals. **DO NOT ALLOW THE PATIENT TO SLEEP FOR AN INSTANT.**

BLOOD POISONING FROM KIDNEY DISEASE.—The patient will be unconscious, with convulsions similar to epilepsy, and must at once be put to bed between blankets. Apply cold to the head and warmth to the feet. A mustard poultice on the loins will give relief. Medical aid must be summoned at once, and if there is any delay in getting this aid, you should administer a purgative.

CONCUSSION OF THE BRAIN.—This may be slight or severe. It is caused by falling from a height, and alighting on the feet, or by a blow on the head. The patient may be said to be stunned.

In a *slight case* the patient will feel giddy and confused. In a *severe case* he will be partially insensible, but will answer when spoken to. He will relapse immediately afterwards into an insensible state, a little later he will probably vomit and then recover slowly. Lay the patient down with his head slightly raised; see that there is plenty of fresh air, unloosen tight clothing and free the neck, and provide that all is very quiet around.

A *very severe* case is similar to an attack of apoplexy, and must be treated in the same manner.

COMPRESSION OF THE BRAIN.—This is caused by the skull being fractured and pressing on the brain (*see* Fractures).

SHOCK, or COLLAPSE.—The face will be pale and the patient's skin clammy. If the patient is sensible he will feel chilly. At once

bring about a reaction. Put the patient to bed between blankets, or at any rate lay him flat and cover him up. Apply hot water bottles, or bricks wrapped in flannel, to the extremities. If he can swallow give tea or coffee. A teaspoonful of sal-volatile in water will be beneficial. Do not attempt to give any liquid by the mouth if the patient is unconscious. No stimulant must be given if there is any hæmorrhage or fear of the same.

SUNSTROKE.—In *slight* cases the patient will complain of giddiness and sickness. In *severe* cases he or she will be insensible and convulsive, the face will be flushed, the pulse quick, the pupils of the eyes contracted and the breathing hurried. Remove the sufferer to a darkened room, or a shady place if in the open. See that there is plenty of fresh air round the patient. Loose the clothing at the neck. Apply cold to the head (ice if possible) and the back of the neck. See that the patient is kept quiet.

LIGHTNING STROKE.—If anyone receives the direct stroke of a flash of lightning, there is no doubt death will be instantaneous. In many cases, however, a person who is said to be “struck by lightning” only receives the stroke indirectly. In most cases this is very serious, and in addition to the burns sustained (for treatment of which *see* p. 170), the person will be insensible, and respiration will have ceased or be very feeble. Artificial respiration (*see* p. 152) must be proceeded with at once, and it will probably take some time before the organs of breathing are made to perform their part properly. The patient must have in addition all the treatment for severe shock.

ELECTRICAL ACCIDENTS.—*Do not touch the body with bare hands.* Rubber gloves are always used by those engaged in electrical work. They must be put on when we have to detach the patient from the current. Pull him from the cable by his coat, or break the circuit by raising the part of the body which is touching the earth or a pole of the circuit. When doing this be sure that the hands are covered

by the rubber gloves. When we have released him we may have some difficulty in opening the mouth; this must in that case be done with a gag. Then pull the tongue well forward, and get an assistant to hold same with a handkerchief whilst artificial respiration (*see* p. 152) is performed, which may have to be continued for an hour or two. Do not give stimulants. The burns will require the usual treatment (*see* next Chapter). At the outset of an electrical accident medical aid should be summoned.

CHAPTER XIII.

BURNS, SCALDS, ETC.

BURNS are created by dry heat, and are very painful injuries. According to the extent, so is the proportion of danger. A severe burn is always attended by shock (*see* p. 167), and thus it is, when a child or an adult has been badly burnt, they do not appear to suffer very greatly in the early stage. Do not look upon this as a good sign.

A burn may be produced by FIRE, EXPLOSION, LIGHTNING, AN ELECTRIC CURRENT, STRONG CHEMICALS, OR THE HEAT FROM THE SUN.

SCALDS are the result of moist heat, and are generally the outcome of an accident with boiling water. Burns are really more serious than scalds, but scalds are more frequently met with than burns.

A burn may be only the scorching of the outer surface of the epidermis (the horny outer skin), or it may be the destruction of the dermis (the true skin) and the muscles (flesh) right down to the bone. In such a serious case as the latter the flesh would be charred.

TREATMENT.—Be very careful in removing clothing from a burnt portion of the flesh. This must be done very gently, or pieces of the flesh will be pulled away. It is best to soak the clothing which adheres with olive oil or warm water, and cut it away bit by bit. If the removing of clothing is not carried out very carefully, there will be much greater disfigurement when the part has healed. The tearing away of portions of the flesh will give very severe pain. If there should be a blister after burning *do not interfere with same*. So many people think it necessary to prick a blister; it is far better to leave it alone.

Exclude air as quickly as possible from the part which is burnt or scalded. This can be done by (*a*) sprinkling flour, starch, or arrowroot on the part and laying cotton-wool, or, better still, wadding, over same.

(b) olive oil or carron oil applied on linen will make a capital dressing, and this also should be covered with cotton-wool or wadding. Carron oil consists of equal parts of linseed oil and lime water. This useful dressing obtains its name from the fact that it was first used at the Carron Ironworks in Scotland. (c) Failing oil, use lard or vaseline. (d) Carbolised oil is a very useful antiseptic dressing for a burn. For a simple burn or scorch, eau de Cologne or vinegar will allay the pain.

BURNS BY LIGHTNING require the same dressing, and in this, as in all cases of burning, do not forget the presence of "shock," for the treatment of which *see* p. 167, and also Insensibility from lightning, p. 168.

BURNS FROM AN ELECTRIC CURRENT will require the usual dressing as applied to ordinary burns. For other treatment *see* Insensibility, p. 168.

BURNS FROM STRONG CHEMICALS.—The treatment depends greatly upon the nature of the chemical which has burnt the part. It may be an ACID or an ALKALI.

If an acid, chalk or whiting may be dusted on the part; if an alkali, dress the part with vinegar. After the neutralisation has taken place, the part may be gently bathed with water in order to rid it of its foe and friend, viz. the alkali and the acid, or *vice versa*.

BURNS FROM GUNPOWDER.—In a case of this kind the part, in addition to being burnt, will be blackened by the grains of powder being driven into the skin, and also by the smoke. This should be very gently washed or bathed with warm water and a little soda, in order to get as much of the powder out as possible. If this should give the patient much pain the treatment must cease. Then dress the injury with linen soaked in carron oil or olive oil; place over this some cotton-wool, and secure same with a handkerchief or bandage.

SUNBURN is due to exposure of the part of the body to the sun's rays on a very hot day. The part will be "puffed up" and red in appearance and will smart severely. Bathe with warm water, and apply some violet powder.

FROSTBITE.—Although caused by the other extreme, *i.e.* excessive cold, it is similar in its effect to a burn. It generally occurs in the nose, ears, hands, or feet. A person may get his nose or ears frozen

and not be aware of same. The part loses the sense of feeling and will be bluish in appearance. The writer's brother went into a public lecture-room in the state of Wyoming, U.S.A., in a city near the Rocky Mountains, when a friend called his attention to the fact that his ear was frost-bitten. He immediately left the building and took the proper measures to save the ear, viz., rubbed it for a considerable time with snow. Never take a person who is frost-bitten into a warm room, and be especially careful to avoid going near a fire, or the part will die and slough (separate) off. If we cannot get snow, rub the part with iced water, or even the application of cold water cloths, frequently renewed will do.

LAMPS should always be placed in a secure position. Those that hang up are much safer. A lamp is easily upset, and then what a scene takes place. It has only to be witnessed once to make those present very careful in future. The lesson, however, frequently costs a life or lives. If a lamp should be upset it may explode, anyhow the lamp will most probably be smashed, and fire from the running oil will spread rapidly. Dresses are ignited almost before we are aware of the fact. **DO NOT THROW WATER ON BURNING OIL.** Throw earth or sand over the flames, this will extinguish them. If there should be any plants in pots in the room, hurriedly withdraw the plants and use the earth. If we have no earth or sand available, smother the fire with a rug or something thick; but be very careful in doing this, not to fan the flames on to ourselves. Put the foot, or feet, on one edge of the rug, and then hurl it over the flames (*see* "Dress on fire," p. 174).

If at any time we should notice a house in flames, it may be only the curtains burning at the window. Do not call the attention of the inmates to the same in any excited manner, but do all that is possible to avoid panic. Having asked someone, or having obtained the proper permission, proceed to the room, snatch the curtains down and throw them in a heap. Then smother them with a rug, and if the woodwork has caught fire throw some water over it, and no doubt serious damage will be averted. If, however, we go to the house in an excited state, probably some of the inmates will faint with fright, or have an attack of hysteria, and there will be general consternation and possibly the house and effects will be entirely destroyed.

If we are awakened in the night by smoke, or smell burning, get up at once, and hurriedly call others. Tell them not to mind much clothing,

but to bring some things downstairs and dress. Whilst all this is being done, go down and see that a means of exit is ready. If a number of persons and children have to come down and we are assured that the kitchen, or a room near the staircase, is in flames, do not open the door of this room, but hurry all downstairs, open the door leading to the street and raise the alarm, then close it, as a draught will assist the fire; rush up and carry some of the children down and pass them out into the street, as willing helpers will be there by this time. When all lives are safe then we may give our attention to the fire.

In the chapter on Insensibility we referred to suffocation by smoke. We now repeat what we said there. If we should have to rescue a person who is in a room full of smoke, take a deep breath of fresh air, then cover the mouth and nose with a wet handkerchief and crawl into the room on the hands and knees and feel the position of the person suffocated, before attempting to catch hold of him. The rescuer must keep his face as near the ground as possible, and drag the patient out of the room. He must be removed into fresh air at once, and artificial respiration (*see* p. 152) proceeded with as quickly as possible.

In closing this chapter we would like to point out some of the dangers which are the cause of burns and scalds. Children are very fond of playing with fire, and they are delighted if they can get a box of matches and strike them. Again, they are frequently scalded by trying to drink out of the spout of a kettle or a teapot. This is very dangerous, as the inflammation caused in the throat may choke them, or at any rate lead to an operation (tracheotomy, opening of the windpipe). Blowing the steam back as it issues from the kettle-spout is another dangerous form of amusement.

CHAPTER XIV.

FIRE.

ENTERING upon this most important subject for "First Aid" treatment, it will be well to give instruction as to the method to be adopted when a person catches fire. A letter appeared in the *Times* of January 7, 1886, from Professor John Marshall, embodying full directions as to "WHAT TO DO WHEN DRESS CATCHES FIRE."

The writer stated that the following was the first thing to be done by a girl or a woman whose dress has caught fire, and similarly the first duty of anyone who goes to her assistance.

"A girl or woman who meets with this accident should immediately *lie down on the floor*, and so, anyone who goes to her assistance should instantly, if she be erect, make her lie down, or, if needful, throw her down into a horizontal position, and keep her in it." REMEMBER, flames mount UPWARDS. If we take a piece of paper, and, holding it erect, light the bottom edge, it is very quickly consumed; but if we hold it horizontally the progress of the flame is much slower, and in some cases it will be extinguished. So if a woman or girl whose dress is in flames should have the presence of mind to at once lie down, the flames, instead of encircling their victim, will only rise into the air. If we take a dress-stand and clothe it and then put a light to it at the foot, we shall see with what fearful rapidity the fire will mount upwards. The opinion of well-known experts is that the body, neck, head, and face are usually far more burnt and disfigured than the lower limbs, and this because the victim has not assumed the prone (lying down) position.

It behoves all women and girls TO TAKE THE SUBJECT TO HEART; accidents occur when we least expect them. In fighting with fire we have a strong and deadly enemy to cope with. A few seconds are very precious, and in such a crisis may mean saving of life. Therefore, to place one's self in a prone (horizontal) position and shout for assistance is the best thing to do; failing this assistance, try and roll over or catch at something near



FIGS. 132 AND 133.—METHOD OF EXTINGUISHING FLAMES
WITH RUG OR BLANKET.

(when lying down) and with it smother the flames. When in a prone position a person may crawl to pull a bell or open a door. Some people might think the latter process dangerous, but experience teaches that the draught from an open door into the room will blow the flames away from the body and perhaps extinguish them. Even crawling along the floor may serve to put out any flames, for, having assumed the horizontal position, they have not much to feed upon. In any case time is gained, and the injury inflicted is minimised.

Should a man go to the rescue of a burning person he runs very little risk. He should instantly throw the burning person down, that is, if she cannot be made to lie down at once; then he may take off his coat, and so stifle the diminished flames with this or any other suitable covering near at hand. Care should be taken to extinguish flames FROM THE HEAD DOWNWARDS (*see below*).

If a woman attempts the rescue she runs a much greater risk, especially if the victim cannot be made to lie down of her own accord, and so the following plan should be adopted. She should take a cloth, blanket, rug, or something suitable, and DRAG THE LOWER EDGE ALONG THE FLOOR IN FRONT OF HER, approach the burning person, and with it envelop her and THROW HER DOWN. If possible get the woman or man to lie down themselves and then the process is much safer.

Approach the sufferer by the head, dragging the lower edge of the blanket along the floor; and, having drawn near, plant your feet on the edge of same (*see* Fig. 132), and fling it forward over the prostrate body; the flames will then be fanned outward across the feet. The rescuer should then uncover the head of the victim, and kneel down to press the blanket round the limbs, and so all fire will be put out (*see* Fig. 133).

Supposing a woman should approach another in flames, even though she be in a prone position, with a rug or blanket raised from the floor and throw it over the sufferer from the proper position (the head), the flames will be most probably fanned backwards and burn the victim's face. Not only this, but THE FLAMES MAY REACH THE DRESS OF THE WOULD-BE HELPER, AND SHE TOO WILL SOON BE ENVELOPED IN FLAMES.

Many cases could be cited where ladies in light attire, ball-dresses for instance, have caught fire and another lady has attempted to render aid; but from the want of knowledge as to the dangers of approaching flames, has lost her own life, or been most seriously mutilated, and perhaps, to say the least, disfigured for life.

WOMEN WOULD DO WELL TO PRACTISE THE METHODS HERE PROPOUNDED; they would then be ready in case of any emergency, and if they were quite

prepared as to how to act, they would be far less likely to lose their presence of mind and run out of the room, and perhaps downstairs, for help, instead of rendering the momentary First Aid so essential in such a crisis. Many a person has been doomed to perish by such action as this; it therefore behoves all women to remember, if they themselves should catch fire, to at once lie down and roll over; or, if they should see another in flames, to instruct them to do so, or, if needs be, throw them down; taking care, of course, to adopt the plan of self-protection as above stated. The writer remembers well seeing a mass of people running helter-skelter, and in a few moments he saw the cause—a lady burning. Even her own friends had run from her in fright. Her light summer clothing was enveloped in flames, and some lace at the front of her neck had just caught fire; snatching this from her and tripping her up, all further danger and injury was averted. Another case may be mentioned to show the necessity for knowledge on this subject. A number of people had dismounted from a vehicle and entered the bar of an hotel; one of the women caught fire; the others, men and women, rushed from the place in their fright, and it was left to the driver of another vehicle to render the assistance necessary. Both these accidents, and many more of a most serious nature, have been caused by THROWING DOWN A MATCH STILL ALIGHT.

How often one sees a man do this—no doubt thoughtlessly; but at the same time they should be made to understand what a dangerous practice this is. It ought to be made a criminal offence, and punishment should be severe; for surely men can blow out a light before casting it to the ground. How many men there are, innocent of the fact that they, through such thoughtlessness, have occasioned most serious injury, and, in some cases, death. Another danger is when, by accident, a box of wax-matches gets upset in the train or on the platform, for instance—the owner picks up a few, and then he may be witnessed pushing the others aside or under the seat with his foot; a woman may tread on one of these, and the result may mean death.

Children should be shown examples of burning in an upright position. Two figures should be set on fire simultaneously, and the one thrown over after two seconds and the other after thirty seconds. This would make a lasting and perhaps serviceable impression.

CHAPTER XV.

POISONING.

POISON may be taken into the system by accident or by a mistake being made by another person in administering medicine, as, for instance, in giving a liniment which may be poisonous instead of a mixture which is not; but poison is more frequently resorted to in cases of attempted suicide.

No poison should be kept in ordinary shaped bottles. It is a foolish method to attempt to seek and give medicine in a dark room; many fatal errors have occurred in this way.

Poisons are generally placed under the following headings:—

1. IRRITANTS, or those that injure or destroy the tender membrane, lining the alimentary canal (*see* p. 30), and create injury to the stomach.
2. NARCOTICS, or those that affect the brain and induce sleep, which may result in death.
3. NARCOTIC-IRRITANTS. A compound of the above, affecting both the brain and the stomach.

We must first of all look for a trace, especially if it is a case of attempted suicide. We shall probably find a labelled bottle which will help us. Failing this we shall perceive certain signs, as follows:—

If it should be an *irritant* poison the patient has taken, the lips will be burnt and stained, and he will suffer great pain in the throat, gullet, and stomach; there will probably be sickness and purging.

If a *narcotic* poison, the patient will be drowsy and will soon pass into a state of stupor.

If a *narcotic-irritant*, there will be symptoms of irritant poisoning, and also delirium and convulsions.

IRRITANT POISONS.—These may be sub-divided into *Acids*, *Alkalies*, and those which are *purely irritant* in their action.

Acids which are most common in cases of poisoning are the following:—Carbolic acid, oxalic acid, nitric (aqua fortis), sulphuric acid (oil of vitriol), hydrochloric acid (spirits of salt), and tartaric acid.

Alkalies are caustic, soda, potash, ammonia, and lime.

Both acids and alkalies are strongly corrosive. They destroy the membrane of the throat, the alimentary canal, the stomach, and burn up the tissue. They also stain the mouth and lips. There will be a great amount of shock (*see* p. 167). If a large quantity of poison has been taken death will soon ensue.

Proper Irritants.—Some of the principal irritants are as follows:—Arsenic, lead, phosphorus (match-heads, rat-paste), iodine (a liniment), nitrate of silver (lunar caustic).

TREATMENT.—EMETICS MUST NEVER BE GIVEN IN A CASE OF ACID POISONING.

Acids are antidotes for alkalies, and alkalies are antidotes for acids.

The following acids may be administered in any case of poisoning by alkalies:—Vinegar, lime juice, and citric acid (lemon juice), or tartaric acid; and the following alkalies for poisoning by acids:—Wall-plaster, mixed in water, chalk in water, lime water, magnesia or whiting in water. Afterwards give olive oil or salad oil, the white of an egg and milk (together or separate), or gum water, to soothe the injury in either acid or alkali poisoning.

In *Vitriol* throwing, wipe the acid off at once, wash the face with soap and soda; then put some olive oil on the part. The eyes may be washed with weak soda and water, and then a little oil put between the lids.

Proper Irritants.—In ARSENIC poisoning give an emetic consisting of a tablespoonful of salt to a tumbler of warm water, or a teaspoonful of mustard to a tumbler of warm water. If you cannot get these ingredients, warm water will do.

LEAD POISONING.—Give an emetic as above, and also a strong dose of salts.

PHOSPHORUS POISONING.—Give an emetic and some magnesia or milk, BUT NO OILS in phosphorus poisoning.

IODINE POISONING.—Give starch and water or arrowroot. If the patient does not vomit give an emetic.

NITRATE OF SILVER POISONING.—Perhaps a piece of caustic will slip

down the throat when using same. Drink, without delay, a quantity of salt and water.

NARCOTIC POISONING.—These are the poisons which affect the brain and spinal cord.

OPIUM, as contained in laudanum, chlorodyne, morphia, and other lozenges (for treatment *see* page 166). Prussic acid, belladonna, chloroform, ether, alcohol, and chloral.

TREATMENT.—**PRUSSIC ACID** is very deadly and we may have hardly time to do anything. Pour cold water from a height on to patient's head and spine. Then resort to artificial respiration. Apply smelling salts to the nose, and give sal-volatile if the patient can swallow. If the patient has not swallowed much of the poison this treatment may be effectual.

BELLADONNA.—Give an emetic at once, and keep the patient from sleeping. We may have to resort to artificial respiration.

CHLOROFORM.—Give bicarbonate of soda in water freely, and keep the patient awake. We may have to use artificial respiration.

ETHER.—Follow the same directions as are given for chloroform poisoning.

ALCOHOL.—Another name for this is intoxication, or drunkenness, and for the treatment of this poisoning *see* p. 166.

CHLORAL.—Prevent the patient from sleeping, but do not use a rough method; apply warmth to the body and extremities. Give strong coffee. In this case also we may have to use artificial respiration.

NARCOTIC IRRITANTS.—These include:—Poisonous wild plants and aconite.

TREATMENT.—In all cases of poisoning by the above narcotic irritants, give an emetic immediately. In the case of poisoning by **WILD PLANTS**, give an emetic, apply mustard over the heart and calves of the legs and administer sal-volatile. Resort to artificial respiration if necessary.

In **ACONITE** poisoning, induce sickness, and after the patient has

vomited we may administer a dose of sal-volatile, and also apply hot bottles, wrapped in flannel, to the extremities. Resort to artificial respiration, if necessary, and put a mustard plaster over the heart.

STRYCHNINE POISONING.—In poisoning by STRYCHNINE, give an emetic *at once*, if the mouth can be opened and the person can swallow. Resort to artificial respiration, if any sign of suffocation, which may be caused by the convulsions. See that the patient does not injure himself during the convulsions. Charcoal given in large quantities will be found useful as an antidote.

In poisoning by FUNGI, after an emetic, give castor oil, and if the pain is severe, apply a poultice to the abdomen.

POISONING BY EATING TAINTED FISH AND MEAT, ETC.—Give an emetic or castor oil. Apply a mustard poultice to the abdomen if the patient is in severe pain.

Mussel poisoning should be treated in the same manner as for tainted meat.

In all cases of poisoning it is very essential to seek medical aid as soon as any symptoms show themselves.

CHAPTER XVI.

FOREIGN BODIES IN THE EYES, EARS, AND NOSE: MEANS OF REMOVAL.

THE EYE.—Small flies or insects, small particles of hard or soft matter getting into the eye, are frequently a source of pain and annoyance. They usually lie on the surface of the eye, but a hard particle will sometimes imbed itself into the surface. For this reason especially we should not rub the eye; this will imbed the substance more.

If alone, the best thing to do is to shut the eye; tears will then accumulate, and probably wash the offending substance to the corner, where it may be extracted. This method failing, and having obtained a mirror, try and pick the irritant off with the corner of a handkerchief or the point of a camel-hair brush.

Make no endeavour to extract a particle if it is imbedded in the front (pupil) of the eye, as this may injure the sight.

Should we be present when anyone else is suffering from the effect of a particle in the eye, ask them to sit down in a good light (if possible); it will be seen that he cannot keep his eyelids apart; they will be constantly opening and shutting spasmodically. Gently separate the lids, pulling them a little forward, and ask the patient to turn his eyes about; the particle may then be seen, and we shall be able to extract it; but do not use for this purpose other than the corner of a handkerchief or a camel-hair brush, as mentioned above.

If firmly imbedded, or the particle be on the pupil of the eye, seek an oculist's assistance at once, as the organ of sight is of such delicate construction that we may easily create serious injury by meddling with it.

We may in a case of this kind put a little olive oil on the eye between the lids, then some pads of soft material may be secured over the eye by a triangular bandage folded narrow (*see* Fig. 74). This will prevent any movement of the lids, and thus save pain.

If a foreign body is not fixed, but only on the eye, it may be removed by the following means.

UNDER THE UPPER LID.—Sometimes the cause of mischief may be removed by drawing the upper lid forwards and downwards over the lower lid; then when we release the same, it will resume its proper position, but in doing so the eye will be swept by the lashes of the lower lid, and the particle removed.

Another plan is to seat the person in a chair and ask him to look downwards, then take hold of the upper lid gently, pull it forwards, and turn it back on itself; or if you cannot do this, get a thin pencil, match, or something similar, and turn the lid over this. The particle may then be removed from the inside of the lid with the corner of a handkerchief.

UNDER THE LOWER LID.—Pull the lid downwards and remove the particle with the corner of a handkerchief.

NEVER CATCH HOLD OF THE EYELASHES to move the lids; take hold of the lid itself.

THE EAR.—Cases of foreign bodies in the ear usually concern children. In saying this we mean serious cases. Adults as a rule only suffer from the effect of insects making their way into the ear. Then the treatment is very simple. We have only to pour a little olive oil into the cavity and the insect will probably be killed, or at any rate washed out of the ear.

If it should not make its appearance, a little syringing will speedily bring forth the trespasser.

Some people have a great dread of earwigs getting into the ear; if we have a little olive oil at hand we need not worry ourselves.

In the cases, however, of extraordinary objects which children seem to have such a fascination for pushing into the ear, the treatment is often of a very difficult character, and must only be undertaken by a doctor.

Some objects which they insert will increase in size, and therefore be firmly fixed. As an example, peas or beans. If we cannot obtain medical assistance at once, we must not on any account probe about with sharp instruments, such as hairpins, bodkins, etc.

The only safe remedy we can adopt is to attempt to drive the

obstruction from the ear by syringing. If, however, the object can be seen, it may perhaps be withdrawn if a sticky substance be applied to it.

When syringing the ear, do not press the syringe into it.

THE NOSE.—If a foreign body is fixed in the nose, press the free nostril and ask the patient to blow his nose, or if snuff is applied to the free nostril the patient may sneeze. These remedies will probably remove the obstacle. Children should be warned not to put anything into the nose. They should be told of the danger and pain that follows upon such a proceeding.

Foreign bodies entering the tissue (flesh), such as splinters of wood or metal, should be extracted at once if we can get a hold with pincers.

A needle broken off in the flesh is very dangerous; the portion remaining must be kept and handed to the doctor, whose aid must be sought at once.

CHAPTER XVII.

TRANSPORT OR CARRYING OF THE INJURED.

HAVING rendered "First Aid to the Injured," it will in the majority of accidents fall to our lot to see the patient safely removed to his home or to a hospital. We shall, therefore, in this chapter endeavour to give details of the various methods which are generally adopted, and also some idea as to improvising means of transport.

An accident may occur miles from medical aid, and often where difficulties will have to be overcome.

For instance, we may be on the coast, and perhaps an accident happens which causes a fracture or dislocation of the thigh. We shall have to organise assistance, improvise splints and bandages, also means of carrying, it may be, up a steep rugged path on the cliff-side. Probably there is no house or cottage near, and therefore we may have to arrange to carry the patient several miles, or else accept the kindly offer made by the driver of a passing cart. Should his offer be accepted, it would be necessary to understand the method of placing an injured person in a cart or vehicle.

MEANS OF ASSISTING (SINGLE-HANDED) CONSCIOUS PERSONS.—

In assisting an injured person, *do everything very gently* and bear with any unkindness on his part.

In a case of accident where we happen to be the only person at hand to help, if the patient is suffering from loss of blood, or say a fractured arm, we must get him to place his sound arm round our neck, letting his hand fall over the shoulder. We must then grasp his hand and put the disengaged arm round his waist, with the hand on the opposite hip. In this way we may assist him home.

If he has sprained his ankle, we may help him in the same manner. He, having the injured limb nearest to us, need not put it to the ground, but can rest his weight on us and, so to speak, "hop along." With the fore-arm, if uninjured, he can assist himself with a stick.



FIG. 134.—TWO-HANDED SEAT.

We can also carry a person with a sprained ankle "pick-a-back" as school-boys do.

MEANS OF CARRYING (SINGLE-HANDED) UNCONSCIOUS PERSONS.

—If we have to remove a person who is unconscious, or who is disabled in the lower limbs, we have a much more difficult task to perform.

A light person—a child or slight woman—may be carried in nursing or sitting posture. In the case of an adult, however, should he be unconscious, great difficulty will be experienced in getting him from the ground. When picked up, the carrying is an easy matter.

If we try to raise him so as to carry him "pick-a-back," we must put the unconscious person in a corner or against a wall in sitting posture, spread his legs apart, and crouch down between them, with the back to the patient. Take his two arms over the shoulders, and we shall be able to gradually hoist him on to the back.

It is only those who have had experience in such matters that can appreciate the dead weight of an insensible person.

Another method, "The Fireman's Lift," which leaves one arm free, so that a fireman can bring a person down a ladder. Members of fire brigades have special drill in this work.

To accomplish lifting by this method, we must turn an insensible person face downwards, and place his arms to his sides, then, standing at his head facing him, drag him up on to his knees or, better still, his feet; place his right arm over our left shoulder and back, bringing it round under our left arm, grasping the hand in our left hand. Place our right arm between or around his thighs; our shoulder will then be at his stomach. We now draw ourselves upright, and the patient's body will be across our shoulder. The hand of the arm which is around or between his thighs must grasp the right hand or, better still, the wrist of the patient, which we are holding in our left hand. Having done this, our left hand will be free.

MEANS OF CARRYING (WITH TWO BEARERS) CONSCIOUS OR UNCONSCIOUS PERSONS.—This is best carried out by *Hand Seats*.

A *Two-handed Seat* (see Fig. 134). The two bearers stand opposite each other; one locks the fingers of his right hand with those of the left hand of the other bearer, each placing his disengaged hand on the other's shoulder.

If we wish to pick a person up by this method, the two bearers should take positions, one on the right and the other on the left side of the patient, and kneel down on one knee. Join two hands under his thighs, and cross the other arms behind his shoulders. If conscious, he can then adjust himself by putting his arms round the bearers' necks. After rising together and lifting the patient, he may be carried some distance by this means.



FIG. 135.—FOUR-HANDED SEAT.

MEANS OF CARRYING (WITH TWO BEARERS) CONSCIOUS PERSONS.

—*A Three-handed Seat* (see Fig. 136).—Two bearers stand opposite each other. One of them, whom we will call A, grasps his left wrist with his right hand, and the other bearer, B, grasps A's right wrist with his right hand, and A grasps B's right wrist with his left hand. The left hand of B is then placed on the right shoulder of A as a support for the patient's shoulders.

We must not use a three-handed seat if we have to raise a patient from the ground. It is only for use when he is able to assist himself into the seat.



FIG. 136.—THREE-HANDED SEAT.

It makes a firmer seat than the two-handed, and one arm is sufficient support to the shoulders when a patient can help himself a little.

A Four-handed Seat (see Fig. 135).—To make this seat both bearers grasp their left wrists with their right hands, and then grasp each other's right wrists with their disengaged (left) hands.

A seat of this kind can only be used if the patient can be trusted to support himself when being carried. It is a much less strain than the other hand seats, and forms a good firm seat for the patient.

Whilst we are dealing with the subject of carrying, it may be well to add just a word of warning as to a method which is sometimes adopted. It is occasionally resorted to for fun, or for the removal of an unruly person. It is termed "The Frog's March," the person being carried face downwards by the arms and legs. It is a most dangerous practice, for it may produce serious injury or cause sudden death. The law should be such that any persons adopting this means of carrying should be severely punished.

Stretchers.—There are many patterns of stretchers, and we certainly think that all institutions, factories, and workshops should be provided with one. If a person is injured, so much depends upon the manner in which he is removed; and transport by this means saves an immense amount of pain and suffering.

We are glad to record the fact that the supply of stretchers is becoming more general. A few years ago the public would have been shocked at the sight of a stretcher, and we are quite sure no one would have been seen carrying, or in any way associated with this merciful appliance.

Now, the best-dressed person and the labourer vie with each other in lending a hand in case of accident. It has become an honour to belong to the fraternity seeking to emulate the Good Samaritan's treatment of the wounded traveller, who, "after he had bound up his wounds, pouring in oil and wine, set him on his own beast, and brought him to an inn, and took care of him."

EXTEMPORISED STRETCHERS.

It is very necessary that everyone should have a knowledge as to how he may extemporise a stretcher, because at the time of accident we may not be able to procure a properly constructed one. A stretcher may be available a mile or so away, but probably we should not know

this, and supposing we did, time is very precious in the case of most injuries.

A *Coat Stretcher* (see Fig. 138) is made with two coats. Two great-coats will serve the purpose equally well—indeed, for a large patient they will be better.

Turn the sleeves of the coats inside out, and, having obtained two poles long enough, pass each pole through one sleeve of each coat; then button the coats together, and let the buttoned side be the underneath portion of the stretcher, as buttons are not pleasant to lie upon.

One coat with the sleeves turned inside out, or even one or two waistcoats, if the weather is chilly or wet and the bearers cannot part



FIG. 137.—A FORM STRETCHER.

with their coats, put over two poles and buttoned as above, will make a seat on which a person, leaning against one of the bearers, could be carried.

A *Sack Stretcher* is made with two sacks having holes cut through the bottom corners, and then passing two poles through the two sacks.

A *Form Stretcher* can be made as follows:—Get two school forms, place them side by side, and lash them together with cord, hay, or straw bands; and having covered the top of same with hay or straw, or some soft material, get two poles and pass them under the forms, one at each end inside the legs (see Fig. 137). Four persons could carry a patient any distance on a stretcher made in this way. The fact that they are marching at the sides of the forms will serve as a protection against the patient slipping off.

A *Blanket or Rug Stretcher*.—Obtain a blanket or rug, and lay it out flat; then obtain two poles, and put them one on each side of the material. Roll the poles up in the blanket or rug until the material unrolled makes a stretcher wide enough to carry a patient.

Many other means can be adopted for extemporising stretchers,



FIG. 138.—A COAT STRETCHER.

such as hurdles, poles with rope fastened across from one to the other, and shutters.

If we cannot get poles long enough, we must lash shorter things together. Clothes-props make very good poles, but we must always test their durability, as, after exposure to all weathers, they may be somewhat rotten; and if a stretcher should break down it may occasion much more serious injury than that which has already called for our assistance.

The rules and methods, as below, are somewhat similar to the instruction given to classes of the St. John Ambulance Association, which has been of such vast service in all parts of the world.

1. Carry any kind of stretcher when loaded at the full arms' length, and never place same on the shoulders.
2. Always carry a stretcher with the patient's feet first, except in a case of fractured thigh; then the patient must be carried *uphill* with his head first.
3. When two bearers, the tallest must take the head of the stretcher, and face it. He will be No. 1 bearer. When lifting a loaded stretcher, No. 2 bearer, at the feet, with his back to the stretcher, will grasp the poles, but not attempt to lift until he feels No. 1 has commenced to do so. The patient's head must never be lower than his feet.
4. When two bearers who are the same height are to carry a stretcher, the strongest should take the head, as he will have the greater portion of the weight.
5. Bearers when carrying a loaded stretcher must not keep step. No. 1 at the head should start with the left foot and No. 2 with the right. The knees must not be stiff: walk with them bent a little; this will enable the patient to travel easier.
6. On no account run with a loaded stretcher.
7. If it only means going a little farther round to find an opening, do not attempt to cross a ditch or to put the stretcher over a wall.
8. If it is a necessity to cross a ditch, and, say, three or four bearers are carrying a stretcher (see Fig. 139)—the diagrams show the position of the bearers when either number are available. Then the following are the movements:—(a) lower the stretcher to the ground with the feet of the patient towards the ditch; (b) two of the bearers get into the ditch,

and (c) all lift together, and place the foot of the stretcher on the opposite side of the ditch. Then one or two bearers get out of the ditch and take the foot of the stretcher on the bank. Two bearers must remain in the ditch. The bearers at the head of the stretcher, or, at any rate, two out of three all told, must be in the ditch, and when all are ready, (d) the stretcher must be lifted on to the other side of it. Then the bearers must resume their places and proceed. If four bearers, one takes the head, one the feet, and the other two march one on each side of a loaded stretcher.

9. If the stretcher has to be carried over a *wide ditch* (see Fig. 140) or any excavation, which may be the case when accidents occur at a quarry, (a) lower the stretcher as before, with the patient's feet to the ditch, and if only three bearers, (b) two get into the ditch and lift the stretcher until (c) the head of same is resting on the bank. Now the foot of the stretcher must be held by one or two bearers, who must keep it level; (d) the two bearers on the bank get into the ditch, all lift together and remove the head of the stretcher from the bank, (e) then lower same steadily to the ground. After a short pause, if only three bearers, (f) two must take the foot of the stretcher and all lift together, and place it on the opposite bank. (g) One bearer gets out of the ditch, two remain at the head of the stretcher, keeping it level. When ready, all lift together and place the stretcher on the opposite bank.
10. To lift a stretcher over a wall (see Fig. 141), we must proceed as follows: (a) Lower it about a yard from, and with the feet to the wall. (b) Two bearers then take the foot and one or two the head of the stretcher; then lift steadily together, keeping the patient level, and placing the foot of the stretcher on the wall. (c) Now one or two bearers must get over the wall and take the foot of the stretcher. (d) All then lift together and carry the stretcher forward until the head of it is on the wall. (e) The two bearers at the head now get over the wall, (f) and the stretcher is lifted down. Then we proceed as before, remembering to walk in broken step.
11. If we have to put a loaded stretcher in any vehicle, we

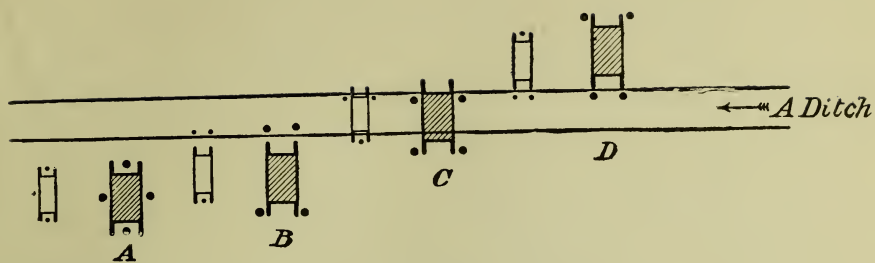


FIG. 139.

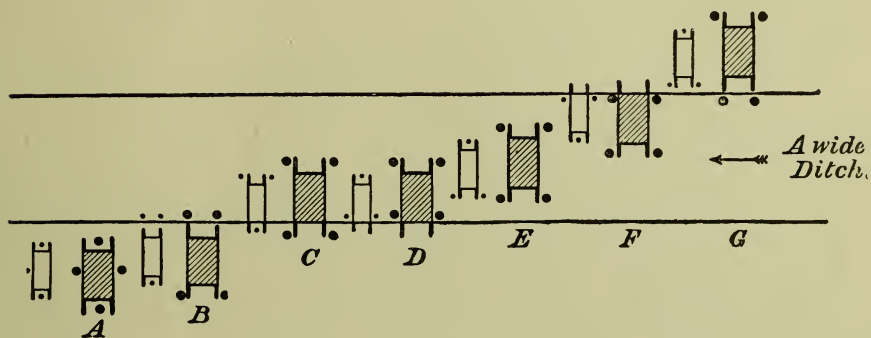


FIG. 140.

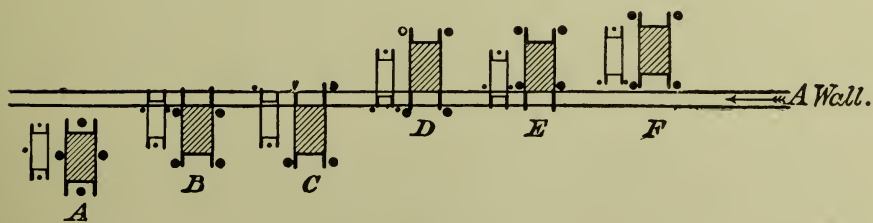


FIG. 141.

must obtain one that travels easily if possible. *To lift a stretcher into a cart or waggon*, we lower it with the foot to the back of a cart, having first of all seen that the tail-board is chained level and securely. Two bearers take positions, one on each side of the foot of the stretcher, and one or two bearers at the head of the stretcher. We then lift together, and place the foot of the stretcher on to the tail-board. One bearer now gets into the cart, and two go to the head of the stretcher and lift the same into the cart. The stretcher must then be securely fastened to the vehicle. See then that the head of the stretcher is either higher, or on a level with the feet when placed in the cart; if not, something must be securely placed to raise the stretcher at the head. If the cart is higher in front than at the back, it will be best to place the head of the stretcher in the cart first.

12. A waggon or cart used for the removal of injured persons should have its floor covered with straw or hay.
13. *To remove the stretcher from a cart or waggon*.—Two bearers go to the head of the stretcher (if the foot is to the front of the cart), and one or two bearers get into the cart, and after untying the lashing securing the stretcher, and taking the foot, all lift (slightly) together, and carry the stretcher backwards, until the foot of it can be rested on the tail-board. The bearer or bearers now get out of the cart. Two bearers stand one on each side of the foot of the stretcher. The whole lift gently together, taking about three side-paces from the cart, and lower the stretcher carefully to the ground. We then take up proper positions and carry the patient into the hospital or home, as the case may be.
14. Never place a person suffering from a fracture of the thigh, leg or ribs in a *cab* of any description. If we do so we are almost certain to create further injury.

There is another method of transporting the injured, and that is by a *Litter*. This is a wheeled carriage with a stretcher which can be lifted on and off. Litters are placed about in many towns in case of accident. If ever we should have to assist in using a litter, we must lift the stretcher off the litter and place it on the ground by the patient. On no account lift the patient from the ground and place him

on the stretcher when it is on the litter; but put the patient on the stretcher and then lift the loaded stretcher on to the litter.

Many towns are now provided with ambulance waggons, which are the means of alleviating much pain and suffering. In some large manufacturing districts, or where there are iron furnaces, collieries, etc., the infirmary or hospital is perhaps some miles away. It is then that the ambulance waggon proves itself of such valuable service. As we write, we have in view the ironworks, near Wellingborough. In this town they have an ambulance waggon well housed and cared for by the local authority, and a splendid body of willing hands trained to their work—a corps of the St. John Ambulance Brigade. There are many workers in this district whose thanks are unbounded for the timely aid which has been rendered them by those kind-hearted efficient helpers, and also for the provision of the excellent ambulance waggon. In all cases of serious accidents, the services of the waggon and volunteers can be requisitioned, and the transport of the injured to Northampton Infirmary is performed very quickly.

In the metropolis there are a number of these vehicles, chiefly the property of the St. John Ambulance Association, and they are very frequently needed in the public thoroughfares. Another service of great utility carried on by this Association is the transport of invalids to whatever districts they are obliged to go.

In the large towns of Scotland—at Edinburgh and Glasgow, for instance—the waggons are provided by the St. Andrew's Ambulance Association. This Association does a great work in North Britain.

The ambulance waggons used for accidents, and which may be seen in the streets of London and other towns, on public occasions that draw together great crowds of people, are, of course, never used for infectious cases.

In London we have the Metropolitan Asylums Board, who have a number of ambulance waggons, for the conveyance of infectious cases, placed at various points, and also steamers on the Thames for the removal of these cases to the floating hospitals near the mouth of the river.

There is a large body of men and women who have been trained in First Aid work, who voluntarily give a lot of time in helping the sick or injured. Some thousands are banded together for drill and practice, and not only this, but for actual First Aid work for the benefit of the general public. The St. John Ambulance Brigade is the name by which this large body of First-aiders is so well known

throughout the kingdom. In all parts of the country they may be seen doing duty on any public occasion. On the day when King Edward and Queen Alexandra were crowned, the members of the Metropolitan Corps of this brigade were on duty for many hours in succession, and treated hundreds of cases.

Visitors to the Royal Agricultural Show, which is held in various parts of the country, have probably seen the station equipped and carried on by the brigade. All the work is voluntary, and is done out of a pure spirit of devotion to the cause of aiding suffering humanity.

Before closing the subject of "Transport of the Injured," we give some particulars which will be found useful, should we at any time be called upon to assist in

LIFTING PATIENTS ON TO STRETCHERS.—The instructions below are intended for use when we have a properly-constructed stretcher to deal with. If we have to use an improvised stretcher, we must modify the instructions to allow the handling of same.

When we are about to remove a patient, the position that a stretcher should be placed in depends very much on the size of the room or place in which the sufferer is lying. When space will admit of it—as of course, almost anywhere out of doors will—the stretcher should be put in a line with the patient, the head of it being a short distance from the patient's feet.

If there are four bearers, two take up positions on each side of the patient facing each other. All kneel down on the left knee and join hands under the patient's shoulders, hips, thighs, and legs. We must do this as gently as possible, and push our hands under the hollows and then slide them carefully into their proper positions.

Having secured a firm grip with each other's hands, we must rise together evenly and slowly, and then, with short side-paces over the stretcher (taking care not to stumble), halt together, and lower the patient, very steadily, on to the stretcher.

This done, one bearer takes up a position between the poles or handles facing the head of the stretcher, and another at the foot of same with his back to it. The other two bearers take positions one on each side of the stretcher.

When lifting, we must remember never to lift the foot of a loaded stretcher first, but always the head of it, very slightly, in advance of the foot.

DO NOT MARCH IN STEP.—NEVER STEP ACROSS A PATIENT ON A STRETCHER.—When only three bearers, place the stretcher as before. Two bearers face each other, one on each side of the patient, the third bearer attending to the lower limbs. All kneel down on the left knee. The two bearers facing grasp each other's hands under the patient's shoulders and hips, the third bearer places his hands so as to lift the lower limbs. Then rise steadily together, and take side-paces over the stretcher, halt, and lower the patient on to the same. The two bearers then lift and march as instructed, whilst the third bearer marches on the wounded side and looks after the patient. If they have some distance to go, the bearers can change places, and so rest. To do this the stretcher must be lowered.

Supposing we cannot put a stretcher in a line with the patient, but only at his side, we must, if possible, get four bearers for this, as three bearers should kneel down at the patient's side, and, putting their arms underneath him, gently raise him on to their knees (possibly two could do this), and then the fourth bearer must push the stretcher into a position so that they can lower the patient on to the same. If, however, four bearers cannot be obtained, and it requires three to raise and lower the patient, the stretcher must be placed at the side of the patient, the three bearers, having lifted him on to their knees, must then lean forward and lower him on to the stretcher.

Should we have to take a loaded stretcher upstairs, the head of same must go first, and those who have the foot part must raise it and do all they can to keep the whole level. Be sure and see that the patient is secured by a strap or something of the kind to the stretcher before attempting to take the same upstairs.

If we have to remove a patient *from a stretcher to a bed* the means to be adopted depend very largely upon the size of the room and bed. If it is a narrow bed, it is best to place the stretcher in a line with it, with the head of the stretcher to the foot of the bedstead. Then the bearers, standing on each side of the stretcher, lift the patient, as directed in previous instructions, and carry him over the foot of the bedstead and lay him on the bed.

If the size of the room will not allow us to put a stretcher in at the foot of the bed, as described, we must place the loaded stretcher at the side of the bed. The bearers then kneel down and put their arms under the patient and lift him on to their knees, and ask someone to remove the stretcher. They then rise together, step forward, and lower the patient on to the bed.

A firm mattress is the best for all injuries, as there is so much difficulty in changing the bed-clothes on a soft mattress.

Never put a patient with a fractured thigh or leg on a soft bed If possible in cases of this nature do not place the patient on a large bed; single beds are best in all cases of illness. In a case of fracture the bed must be quite firm so as to prevent the patient slipping. A wire-woven mattress will yield a little, so in all cases a few light boards must be placed on it. Never use a feather bed; a straw palliasse or horse-hair mattress should be placed over the boards. The patient should lie with the head as low as possible; no pillow must be allowed.

Remember, one of the first things we have to do in a case of accident is to send for a doctor, and if we can give the medical man some of the particulars of the injury, all the better, as this will guide him as to what he will need to bring with him. Should we get the patient to bed before the arrival of medical aid, we must see that hot and cold water are ready, also towels, basins, etc.

In conclusion, we sincerely hope that these chapters devoted to the subject of "First Aid to the Injured" will be the means of enabling many readers to render timely and useful help when an accident happens. There is nothing more heartrending than to see pain and suffering, and be unable to assist in mitigating it. Unfortunately loving hands and kind hearts at such times are likely to, indeed often do more harm than good, simply from the want of knowledge of this useful subject.

THE LADIES' PHYSICIAN.

THE LADIES' PHYSICIAN

CHAPTER I.

PUBERTY.

Importance of—Age at which Menstruation first appears—Conditions which affect it—Climate—Race—Hereditary Tendencies—Social Position—Habitation—Change of Figure preceding the Appearance of Menstruation—Diet at this Period—Clothing—Exercise.

PUBERTY—the time of transition from girlhood to womanhood—forms one of the most important epochs in the life of the human female. It is a time when great demands are made upon the constitution, in consequence of the rapid development of the intellectual, the emotional, and the generative systems. It is one peculiarly liable to disturbance of the physiological processes which naturally go on in the body, and to attacks of disease. Marked care should be taken of the young girl at this period, with a view to favour the natural processes which are taking place, to ward off evil influences, and establish the general health as well as the functions of special organs. One of the most marked of the latter is the discharge, every month, of a sanguineous fluid from the generative organs—or menstruation. When this function is naturally and healthily established, it is generally and rightly considered that a great crisis has been passed. When, on the other hand, it is not established at the proper time, or but imperfectly, the condition of the young subject is regarded as one of anxiety. Every mother should be acquainted with the physiology of this subject and of this period, in order that she may know what to expect, understand the meaning and value of certain peculiar symptoms which not infrequently make their appearance at this epoch, recognise those of evil omen, and place her child in the most favourable conditions to pass through a time which must always be regarded as one of considerable anxiety in a favourable manner.

At this period, physical and moral care and education are of peculiar importance, for lack of either may result in disease, which can with difficulty be eradicated; while, on the other hand, both the mind

and body are in such a plastic state that by proper treatment they can be moulded, in a great measure, according to desire.

The above observations are more or less true of infancy, childhood, and the whole period of growth and development, but they are especially true of a time when a function which is acted upon by, and reacts upon, all the other functions of the organism in such a marked and mysterious manner as the functions of the organs of generation is being developed and established.

We will, therefore, in this chapter briefly describe the changes which take place at this period, and point out the general home treatment that is likely to lead to a favourable issue.

THE AGE AT WHICH MENSTRUATION FIRST APPEARS.—This varies considerably in different individuals. The average age, calculated from observations made in a very large number of cases, is in northern lands about the fifteenth year. It may, however, appear much earlier, and may be retarded to a much later age. Indeed, instances are known in which infants have suffered from a monthly discharge of sanguineous fluid from the genital organs, accompanied by all the symptoms of menstruation. On the other hand, cases are on record in which the appearance of the menstrual function has been delayed until after the thirtieth year. Both are, however, of great rarity, and should be regarded rather as curiosities than as normal evolutions. It is, at the same time, well to bear in mind the possibility of such occurrences, especially as mothers are liable to become over-anxious about a retarded puberty, and desirous to force the appearance of what the young girl is not yet prepared for. There are other rare cases in which menstruation never appears throughout life, or where it is established only after marriage or after pregnancy. The cases where the function is never performed are probably instances of deficient development, or absence of some of the organs of generation; while those in which it is established only after marriage are cases in which those organs have not attained full development before marriage was contracted.

There are several conditions which appear to exercise a marked influence on the time of the first appearance of this monthly flow. Amongst these the most important are climate, race, hereditary tendencies, social position, and town and country life.

CLIMATE.—In the climate of the British Isles there is a great variation in the time of the appearance of the first flow in different women, but, as has been said, the average age is about the fifteenth year. In hot countries, as India, the average age is about thirteen; while in cold climates, as in the North of Europe, menstruation is

not established until about the seventeenth year. Moreover, in hot climates girls pass into womanhood, and become old, at an earlier period of life than those who dwell in colder climates.

RACE.—Inasmuch as different races inhabit different climates, it is difficult to attach to race and climate the exact influence each exercises on the first appearance of the menstruation. Both usually act together, and the influence of each is in the same direction; yet it cannot be doubted that race plays a marked influence in determining the first performance of the function we are considering; for Englishwomen brought up in India menstruate for the first time about fifteen, while the Hindoo women are regular at the age of twelve or thirteen. Observations made in several nations prove the same thing; but none are more striking than the one just mentioned.

HEREDITARY TENDENCIES.—The females of some families menstruate early, while in those of other families the function is late in its appearance. Occasionally the daughter becomes regular for the first time at the same age that the menstruation first appeared in the mother. This may happen in two or three generations, though, owing to numerous causes, it occurs only rarely.

Social Position has a determining influence on the date of the first appearance of the catamenia, or menstruation. Girls of the higher classes of society, who lead luxurious, sedentary lives, whose diet is rich, stimulating, and abundant, are regular at a somewhat earlier age than those whose fare is scanty, who work hard, and are accustomed to muscular exercise, etc.

The last element which exerts an influence on the appearance of the monthly flow which we shall mention is *Habitation*. Those who live in large towns, and who are subject to the exciting influences of the social life of cities, menstruate earlier than women who live in the country.

All these conditions should be kept in mind when the time of puberty is approaching, so as to have some idea of the time when the appearance of the monthly flux may be expected, and to relieve any anxiety that may be felt on account of its precocity or retardation.

The quantity of the discharge varies much in different women, and consequently it is impossible to fix the exact amount proper to any individual subject. The personal experience of the female herself alone can do this. In some the flow is habitually scanty, lasting a day or two only; while in others it is profuse, lasting seven or eight days. In the great majority of cases, however, it lasts from three to five days. By the Mosaic law, five days was fixed as its duration. It is

not improbable, however, that, owing to peculiarities of the race and the climate inhabited by them at the time the laws were given, its duration was somewhat more prolonged than it is usually in Great Britain.

In many cases menstruation makes its appearance suddenly and unexpectedly, without any previous warning. In some cases accidents, falls, over-exertion, or horse-riding, may determine the first flux. A girl should always be forewarned against being frightened when this happens, by being duly and properly informed beforehand of the changes that are taking place in her system, and of what she may expect. This is the mother's duty; and the due performance of it may not infrequently save from very serious consequences. It has happened that the flux has taken a girl unawares, that she has become frightened, thought herself injured, and bathed herself with cold water, checked the flow, and thus caused very serious illness. This is due only to gross negligence of duty on the part of those who have charge of her; for it should never be possible for her to find herself in such an unfortunate and cruel position.

Usually, however, Nature warns both mother and daughter of what is coming; changes that cannot be misinterpreted by the initiated take place in the organisation of the young girl, which point out that the period of transition to womanhood is approaching.

The form—no longer thin, angular, and clumsy—becomes plump, rounded, and graceful. The gait becomes firm and animated. The chest enlarges, the hips grow broader, the breasts develop and become full and round. The whole body, indeed, partakes in the process of development—the girl becomes a woman.

Besides interpreting the meaning of these changes to her daughter, a mother may do much to favour the normal performance of the function of menstruation, and to preserve and establish the health of her child at this critical period. Her efforts should be directed to physical and moral training. With regard to the latter we shall say little or nothing, but the former falls in an especial manner within our province. And first of all of

FOOD.—The rapid growth of the body, the development of its various organs, and especially of the system of generation, demand an abundant supply of nourishing material. By this is not meant luxurious living; that would be productive of mischief. Besides laying the foundation for habits of indulgence and of ease, it has, as has already been mentioned, a tendency to bring about a too early advent of menstruation, before the system is properly prepared for the drain which that function entails, and before the organs concerned in its performance have

attained the degree of maturity requisite for its healthy continuance. It is not luxurious living, then, but plain, wholesome, nutritious food that should be the fare of the young girl who is approaching the period of puberty; meat twice a day, plainly cooked, with vegetables, milk, and fruit puddings. Stimulants—even beer—are, as a rule, quite unnecessary.

CLOTHING.—Girls should be warmly clad from an early period. They should wear flannel next the skin, a flannel vest, and drawers drawn closely, but not tightly, round the leg, just below the knee. Warm clothing is particularly necessary when puberty appears: especially should exposure to severe cold when imperfectly clad be avoided during the menstrual epochs. Imprudence in this respect may be productive of severe mischief, as will be pointed out in the next chapter. It is better to wear flannel next the skin than to interpose linen between, because the former not only prevents the dispersion of the heat of the body, and so preserves the general warmth, but it also gently stimulates the cutaneous surface, favours the circulation as well as perspiration in it; and when, after exertion, while the skin is acting freely, exposure to cold becomes necessary, suppression of perspiration, together with the evils that may result from it, is far less likely to happen.

Stays are very generally worn, and there is no objection to their use, provided only they are properly made. Indeed, they may be of great service, in giving support to a feeble spine, and in helping the full expansion of the upper part of the chest. They should be made to fit the body, should not press on one part unduly, and, of course, should not be tight. It is hardly necessary here to refer to the evils of tight lacing; the fashion has, fortunately, long ago passed, and a very small waist is no longer regarded as elegant or natural to woman.

With regard to other clothing, it should vary according to the season of the year. During the hot days of summer errors are more likely to be committed than at other times, because of ignorance or neglect of the difference in temperature in the day and in the evenings. This difference renders clothes which are ample during the heat of the day quite insufficient for the cool of the evening.

Whether stays be worn or not, clothes should not be tied too tightly round the waist. With a view to avoid the necessity of this hooks should be fastened to the stays, in order to support the clothes and prevent them from slipping, and the tying should be sufficient only to retain them on these hooks. Whatever may be said in favour of the evening dress which is at present in use, it cannot be denied that exposure of so much of the upper part of the body is, in a cold climate, fraught with danger. Slight draughts in hot rooms

frequently give rise to severe colds, and the ordinary evening dress is only too favourable to the effective action of such currents of cold air. In such circumstances, great care should be taken to cover the shoulders after any exercise which heats the blood and causes free perspiration.

EXERCISE.—During the whole period of growth and development the young girl should take regular daily physical exercise. It favours the processes which go on in the body, facilitates nutritive changes, and renders regular and uniform the play of all the functions. Indeed, without exercise there cannot be health. All exercise at command should be undertaken—walking, riding, swimming, dancing. Walking is within the reach of all, and is sufficient to maintain robust health. It should not be taken immediately after a full meal, but in the morning or in the middle of the day, so as to have the combined effects of exercise, of good air, and the stimulating influence of the sun. Riding, when possible, is one of the best forms of physical exercise. It should not, however, be taken to the exclusion of walking.

Swimming is luxurious as well as bracing. The time that different persons can remain in the water with benefit varies much with the vigour of the constitution and the power of endurance. After being in water for some time the body becomes colder, but this should not be allowed to be carried to any considerable extent; for the good effects of swimming depend not only upon the actual muscular effort made, but also on the reaction which should be established after leaving the water. If this reaction fails, swimming and all forms of bathing are injurious. The duration of the bath should be regulated so as to ensure such reaction. This varies much; and some persons may remain in the water for hours, others for minutes, while some can only take a single plunge. After bathing, the skin should be thoroughly dried and rubbed well with a rough towel, so that the whole surface becomes warm and red. Then a glow is felt all over the surface, and a pleasant feeling of lightness and activity. When this occurs, bathing does good, but when it fails bathing should be given up.

Dancing is not only a graceful, but a most healthful exercise. It is, unfortunately, in some countries associated with late hours, hot rooms, and bad hygienic conditions, and the evils resulting from these associations more than counterbalance the good derived from the exercise. For this reason we do not hesitate to condemn the practice of sending young girls to balls and parties, much as we would value dancing exercise when undertaken at proper hours, in the open air or well-ventilated rooms.

Nothing should be allowed to interfere with the regular sleep of young and growing girls; and exercise should be taken up to slight

fatigue, for nothing is more favourable to healthy and peaceful sleep. Early hours should be observed, both in going to bed and in getting up; the air of a room is fresher and healthier in the morning, when it has been unoccupied for several hours, than in the evening, when it is hot and stuffy from burning of gas, candles, or lamps, and from the products of respiration.

CHAPTER II.

SYMPTOMS OF MENSTRUATION—DISORDERS OF MENSTRUATION.

Scantiness or Absence of—Causes of such Condition—Treatment—Suppression of Menstruation—Causes of—Consumption—Disease of Kidneys—Green Sickness and Pallor—Treatment—Hæmorrhage and Other Discharges—Mental Emotion—Treatment.

WHEN a menstrual epoch is about to appear, certain symptoms make their appearance which indicate that the flow is coming. These vary in different women; in some they are absent—there is no suffering of any kind, and the flow appears without their knowledge.

In the majority of cases, however, there is preceding suffering, and the subject is conscious of her condition two or three days before the appearance of the flux. These symptoms consist in a general aching, languor, a feeling of unfitness for work; there is often headache, and a dark ring around the eyes, pain in the back and stomach and down the thighs. Occasionally there is sickness, a slight diarrhœa, and frequent desire to pass water. These are the symptoms which usually precede the flow; they should not be severe, for when they suffice to lay the woman up, they are due to a diseased and not a natural condition. In the next chapter these conditions will be discussed.

One of the first symptoms which usually attracts the attention of women to disorder or disease of the organs of generation is some abnormality in the performance of the monthly function called menstruation. This function is peculiar, so far as is at present known, to the human female. It consists in a discharge of blood and serum from the genital organs. It usually takes place every four weeks; but in some cases this interval is shorter, while in others it is of longer duration. The function is first performed at about the age of twelve to fifteen; it continues to be repeated every month up to the age of forty or forty-five. The process is of so striking a character, so entirely out of the common—indeed, unique—that it has attracted the attention of all people, both civilised and uncivilised. It is the process which marks woman as woman. When the discharge appears, and continues to be repeated without any irregularity or suffering, the girl has become a woman, and it may, with almost absolute certainty, be affirmed that the organs of generation are well formed and of a healthy character. This discharge, then, its appearance, its character, and the regularity of its performance, form a sort of index to the condition of the pelvic organs,

and any deviation from the healthy performance of the function points to something wrong in the general condition, or in the organs which are the source of the discharge. The aberrations in the performance of this function are of three kinds. The menstrual flow may be scanty or absent; it may be profuse, or the bleeding may be repeated too often; and the flow may be accompanied with intense pain. Any one of these conditions indicates that there is something wrong in the constitution itself or with the organs of generation. Moreover, a very large number—indeed, the great majority—of the diseases to which the organs peculiar to the human female are liable call forth or induce one or more of the functional deviations named, so that the importance of these symptoms (for they are not diseases) cannot be over-estimated; for they are the indicators—frequently the first, and sometimes the only ones—of the existence of constitutional or local disease. Further, seeing that, in the great majority of cases, to one or more of the symptoms named are due the troubles, *par excellence*, to which a woman is subject, and that during the interval between successive monthly flows she feels herself perfectly well, it becomes us, in a popular work of this kind, to classify diseases, which we shall discuss under the heads of prominent symptoms rather than according to pathological or scientific relations; because, in order to appreciate a classification based on the latter principles, a thorough scientific training is requisite, whereas such training may not be necessary for the appreciation of one based on the former. Indeed, in actual practice, the process by which a physician or surgeon frequently arrives at a conclusion with regard to the nature of a disease—and this is especially the case with him who treats the diseases peculiar to women—is by analysis—a tracing back of one or more prominent symptoms to their causes, the subordinate or less marked symptoms forming a series of finger-posts to direct him along the right track. We will then, first of all, enumerate and describe those diseases which give rise to the three leading and prominent symptoms named—viz., scanty or absent menstruation, excessive discharge, and painful discharge.

MENSTRUATION ABSENT OR SCANTY.—This condition is technically or scientifically known as amenorrhœa. It is an affection of frequent occurrence. Its causes are numerous and various. It may, and frequently does, make its appearance at puberty. In that case the sanguineous monthly flow does not show itself at the usual age, and the girl, having passed the period of puberty, and the signs of puberty not having made their appearance, becomes the source of great anxiety to herself and to her parents. The causes of this condition are the following :—

1. Absence of the internal organs of generation, or of some portion of them. The presence of some of these organs is absolutely essential for the discharge to take place. The source of the discharge is the body of the womb itself, or the uterus. The inner surface of that part of the organ becomes immensely congested, the vessels give way, and rupture and a flow of blood takes place from them. But the womb may be present and still the discharge may not appear. There are two small organs lodged in the pelvis, one on each side of the womb, called ovaries. These organs are the factories of the germs which, when fertilised and placed in favourable positions, develop and form a child. These organs also appear to have a very important part to play in the monthly function of the uterus, in the formation and flow of the menstrual discharge, so that their absence would entail absence of menstruation. Absence of the ovaries, then, is one cause of amenorrhœa.

This, however, is not of frequent occurrence: the ovaries are not often absent; more frequently they are somewhat smaller, less plump than natural—in fact, somewhat imperfectly developed. When these organs are wanting, the subject of the malformation is asexual. The external characters which accompany this deformity are a general appearance resembling more that of the male than that of the female. The hips are less wide, the pelvis small, the breasts remain flat and undeveloped, the voice is harsh and manly. It is also said that hair grows on the face and chin like the beard of the male. There are present none of those symptoms which precede and accompany menstruation; the recurring headache, the pain in the back, the weight at the bottom of the stomach, the aching of the thighs, the general lassitude, and the dark areolæ round the eyes are all wanting. Indeed, such a person represents to an observer but few of the peculiar characteristics of woman. The ovaries are lodged high up in the true pelvis, at the junction of the true with the false pelvis—a position which renders exploration of the organs during health impossible: so that it is not possible to recognise with absolute certainty absence of the ovaries; yet the general symptoms, positive and negative, go far to prove such absence, or, at least, complete inaction of the organs if they be present. Of course, nothing can be done to remedy such a malformation. At the same time, it should be borne in mind that though the person cannot become a mother, yet the general health is in no way affected by the deficiency, and that she cannot become the subject of many diseases to which well-formed women are liable.

2. Absence of the womb, or uterus. This is the organ which supplies, at the instigation of the ovary, the menstrual blood, and its presence is consequently essential to the performance of the menstrual function. It is also the organ which forms the nest in which the child, or embryo,

is lodged and nourished before its birth; and, moreover, it is the active agent in the act of giving birth, for by the force of its powerfully-contracting muscles is the child driven into the world. Entire absence of the uterus is very rare, but a rudimentary condition of the organ is less rare, though still not frequently met with. In persons in whom the womb is absent or rudimentary the menstrual flux is absent or scanty. The flow may take place without pain, but in many cases the pain accompanying the performance of the function is severe.

The general configuration of the body is womanly, the hips are broad, the pelvis large, the breasts round and well developed. The menstrual molimina, or the aches and lassitude which so often accompany menstruation, may be present, though more often absent. Treatment is vain when the uterus is absent; and when the organ is rudimentary, there are no means yet discovered by which its development can be ensured.

3. The menses may not have made their appearance by reason of an obstruction to their outflow. In such a case the uterus and ovaries are present and perform their functions; the menstrual discharge is poured into the cavity of the womb, but, owing to the occlusion of the outlet, remains dammed up in the cavity of the uterus or the canal of the vagina, or passage leading to the womb. The obstruction is most frequently met with at the mouth of the vagina. It is usually caused by an abnormal condition of a membranous fold placed in that situation and completely closing the passage. This fold of membrane—called the hymen—is a natural structure, forming a sort of imperfect valve to the vaginal orifice, but not completely closing that opening. Complete closure is a condition which, unless remedied, may lead to very serious results. It causes no trouble or inconvenience, however, during infancy and childhood, not indeed until the advent of puberty, and not then unless the organs of generation become active and the menstrual secretion is formed. When the secretion of the menstrual flux begins, the troubles arising from closure of the vagina also begin. The discharge is secreted and poured out of the womb into the passage which leads outwards, in order to be separated and cast off from the body, but the orifice of the vagina, being completely closed by the hymen, prevents the escape of the discharge. In this manner it becomes lodged in the vagina. When the menstrual flow has ceased, but little discomfort, if any, will be felt during the first interval; but when the time of the next flow arrives the trouble returns. In this manner the discharge in the vagina accumulates and increases in quantity. As time wears on, the pains preceding and accompanying menstruation—the molimina—increase in severity. They become more and more intense, and at last agonising. If carefully looked for, a

tumour or swelling may now be found in the bottom of the stomach. It is smooth, elastic, often very tender, the upper part is roundish; it rises from the pelvis, and has the shape and character of the uterus during the early months of pregnancy, and the girl may be unjustly charged with being in the family way. This tumour gradually increases in size every month. It should be noted that the increase always occurs at the times the pains are present—that is, at the times when the discharge is poured into the cavity of the uterus—and not during the interval. The pains in the stomach at last become prolonged and almost constant. The general health becomes deteriorated. The healthy and rosy-looking girl becomes sickly, pallid and sallow. The appetite is lost, there is frequent vomiting, the bowels are confined, and there is constant urinary trouble.

The discovery of such a condition is of the greatest consequence. It should be done in order to save the innocent from foul and unjust aspersions. It should be done in order to relieve her from continual and agonising suffering. It should be done in order to save her life, for so long as it (the state) is permitted to continue, so long is the danger to life imminent. It has just been stated that life is endangered by this condition. This danger comes about in the following way:—The discharge, not finding an outlet, accumulates in the vagina, and distends that organ. When this distension has gone on to a certain degree, and still more fluid is poured into the cavity, the uterus begins to dilate, and this organ in its turn becomes distended; then the Fallopian tubes, which lead from the womb to the cavity of the belly, become dilated, and the menstrual fluid may regurgitate along the dilated tubes into the abdominal or peritoneal cavity. This would give rise to an inflammation of a virulent and fatal character. The consequence would be certain death. But the Fallopian tubes may not have been dilated. In that case the womb itself, by its over-violent contractions to get rid of its contents, which act as a foreign body, may give way by rupture, and the discharge escape, through the opening thus formed, into the peritoneal cavity—to give rise to intense pain and rapid death. Under such circumstances, interference becomes absolutely necessary, with a view to avert ultimate death.

This condition requires considerable skill and knowledge for its discovery. An examination of the parts and organs contained in the pelvis must be made before the state of things can be diagnosed. Digital and ocular examination of the external parts will discover the closure of the vagina and imperforate condition of the hymen. The finger cannot be introduced into the passage, and the eye cannot discover the fissure in the hymen. This, however, is not enough; it is further necessary to make out whether the uterus is present or absent;

and if it be present, whether it is active in its functions, forcing out the menstrual fluid. A further examination is necessary for determining this point, and it is to be conducted through the bladder and the rectum; a sound, or catheter, should be introduced into the bladder, and the finger into the rectum. In this way a full and complete exploration should be made of the organs, of the thickness of the vagina, and of the contents of its canal, whether it is empty, or whether it contains a quantity of pent-up fluid. Careful examination of the lower part of the abdomen above the pubes is necessary, and if a tumour be discovered in that situation its relation to the contents of the vagina should be made out. In this manner a skilled observer can readily recognise the condition, especially when he takes into consideration, in addition to what he observes for himself, the history which has already been told him. In addition to the above symptoms, in some cases the membrane closing the passage is greatly bulged out and thinner, and the dark sanguineous contents of the vagina may be distinguished through it. Such is the history and such are the symptoms of this malformation of the hymen.

The obstruction to the flow may, however, be situated in other parts of the passage than the external orifice. The vagina itself may be entirely wanting. This is always a congenital defect, a malformation existing at birth. It is of rare occurrence. The vagina may be simply a stout thin pouch of varying length, but not reaching the womb. This is likewise a congenital malformation.

The canal of the vagina may be narrowed and completely closed in any part of its course. This condition may have existed at birth, or may be the result of inflammation acquired after that event. This is caused by wounds or tears of the wall of the canal, the result of severe labour or accidentally. Adhesions are formed by the pouring out of inflammatory products, and complete closure of the passage results.

The canal of the uterus itself is sometimes closed at its external orifice. This is, however, rare.

The symptoms in all these forms of obstruction are similar to those met with in imperforate hymen, and the method of examination already recommended for the discovery of the fault should be adopted.

The question now comes, What can be done to relieve these troubles and to cure the deformity? Can the condition be relieved and the patient cured without running any great risk? To this it is to be answered that in the case of imperforate hymen the condition can be readily enough relieved. An operation is required. The offending membrane should be incised or punctured. No operation could be simpler or easier of performance, yet it must be said that it is not free from danger—at least, in many cases. The fact is, that most of these cases

have been going on for a long time before medical advice is sought, and before any efficient means are taken for their cure. Perhaps in many cases medicines, baths, gin, whisky, and the whole series of domestic medicines generally in use have been tried with a view to establish an impossibility—the bringing-on of the flow when there is no outlet for it. These means, indeed, instead of relieving the condition, have greatly aggravated it, for they have doubtless increased the amount of the monthly flow, and in a proportionate degree the sufferings of the patient. When domestic knowledge and skill have been exhausted in vain, then the doctor's advice is sought. He discovers the condition, but only when the vagina and uterus have been for a long time distended and are in a very irritable condition. Under these circumstances an operation for the cure of the malformation is accompanied by great danger—far greater than when performed at an earlier period, before the organs have become so greatly altered in form and texture. The danger arises from the tendency of the womb to contract irregularly, and in this way to drive some of the fluid into the cavity of the peritoneum, thus giving rise to peritonitis.

But peritonitis, or inflammation of the belly, may arise also without regurgitation of fluid into the cavity, simply as the result of the operation.

Operations for the relief of the other conditions causing obstruction to the menstrual flow are more complex and difficult. When the vagina is absent, or a considerable portion of it, the operation is by no means easy, and requires the greatest skill, knowledge, and patience on the part of the operator. The making of a new vagina, entirely or in part, is necessarily accompanied by some danger, but the danger is less than that arising from obstruction to the flow, which will in time necessarily prove fatal unless removed.

When the symptoms which usually precede and accompany menstruation have been present on two or three occasions, and the monthly flow still remains absent, the subject should be at once carefully examined. Should she then seek proper advice, the cause of the absence of the discharge would be found and removed before the fluid has accumulated behind the seat of obstruction and caused distension of the organs above and alterations in their tissues—conditions which not only endanger the lives of the patients themselves, but also render the means of relief dangerous; whereas, were the operation performed at an early period of the menstrual life, it would entail little or no risk, and spare the patient much unnecessary and severe suffering.

Several other causes besides those mentioned may give rise to failure of the appearance of the menses at the proper time; among these no one is of greater importance than that condition known as

anæmia and chlorosis, on account of its frequency. These, as well as others, will be discussed further on.

When menstruation has been regularly and properly established; when the flow has recurred every four weeks on several occasions, and then fails to return at the expected time, it is evident that there is something wrong with the general health or with the organs of generation, unless pregnancy be present. The causes of such cessation are numerous, and all different from those already mentioned. It is evident as the menstrual function has been regularly performed, that the organs of generation are properly formed and fully developed—there is no deficiency in their size and the passage cannot be obstructed.

One of the first symptoms of pregnancy is cessation or suspension of the menses: and when in a married woman the catamenia do not appear at the expected time, she generally believes herself to be in the family way, and she is usually correct in her suspicions. At the same time, there are many other causes which may bring about suppression of the menses in those who have been already quite regular; and this should not be forgotten, for should pregnancy be regarded as the only cause of suspension of the catamenia, many young girls would be unjustly accused or suspected without the slightest cause. These causes we will now proceed to enumerate, and we will at the same time give brief descriptions of the symptoms which usually follow or accompany their action.

Many general diseases give rise to suppression of the catamenia. For the healthy performance of the functions of any organ in the body sound general health is necessary. This is eminently the case with regard to the womb. Disorders of the womb itself give rise to innumerable general troubles, and many disorders of the general health give rise to suppression of the uterine functions. The diseases which cause these troubles are of a depressing and enfeebling character. They deteriorate the blood, partially arrest nutrition, cause wasting of the system, sometimes by some drain on the constitution, sometimes by their interference with the natural processes. Consumption is not infrequently associated with amenorrhœa or menstrual suppression. Indeed, a suspension of menstrual discharge is often one of the first symptoms of this insidious disease observed by the patient herself, and she goes or is taken by her friends to the doctor in order to “have them brought on.” She has not been regular for some time, and she as well as her friends regard this as the source of all the mischief—of all her symptoms. Of this she is so firmly convinced that, in all probability, she has already tried all the means of which she has knowledge, in order to bring about their return, but happily in vain. Indeed, it is often difficult to persuade her and her friends that her symptoms are not

due to the suppression of the menses, but to a much more serious condition, of which the suppression is the consequence. "I am sure," she says, "if they were brought on I should be all right." They have, according to her idea, run to her head or her chest; whereas the real truth is, she is suffering from a severe disease of the lungs, of which she is quite unconscious, and the exhausting effects of this disease on her constitution it is which has caused the suspension of the flowers. In such a case it would be very wrong to attempt to bring on the flow; the constitution cannot afford the loss of so much blood; it is required for other purposes. Indeed, in treating the case, no thought should be given to the amenorrhœa; all the attention should be directed to the disease of the lungs, which is at the root of all her troubles. Nourishment, fresh air, oil, and iron, and change of air, should be the means employed to counteract the mischief.

Another disease which is not rarely a cause of amenorrhœa is that disease of the kidneys known as Bright's disease. This is an affection which causes deterioration of the blood by causing a part of its albumen to pass out through the kidneys with the urine. It causes extreme pallor and dropsy. This form of suppression, like the former, should be treated by attacking the disease of the kidneys, and improving the blood and the general health.

CHLOROSIS, CHLORANÆMIA, or GREEN SICKNESS.—This is a disease very frequently associated with disorders of menstruation, and especially with suppression of the menses. It consists in a deficiency of red blood corpuscles and a watery condition of the blood. The blood is paler and less in quantity than it should be. The disease often attacks young girls at the approach of puberty, and is really a most troublesome disease to cure, defying all efforts and rendering all our skill vain. It sometimes comes on before puberty is established, and strong, lively, rosy, healthy girls become pale, sickly, dull, and feeble. In such cases the catamenia do not appear at the usual age, or only appear but very slightly. In other cases puberty has been attained and crowned by the regular and thorough establishment of the menstrual functions. The person has passed from girlhood to womanhood without a hitch; but soon after she begins to ail, she becomes a little paler, her appetite is fanciful. It is the beginning of anæmia, or perhaps green sickness.

The symptoms of the disease are pallor. In simple bloodlessness the pallor is of a transparent white; in green sickness there is a peculiar and often very striking greenish tinge with the pallor. The skin everywhere is pale, according to the degree of the disease. The lips are pale, sometimes almost white; the gums and mucous membranes

of the mouth and eye are pale. The veins of the skin are bluish and not distended, for the actual quantity of blood is diminished. There is headache: this is almost constant pain in the temples and forehead. The patient is often giddy, and has noises in the ears. She complains of pain under the left breast, but she is not feverish. She has often pain along the spine, in the neck, between the shoulders, and in the loins. She complains of pain here and there of a neuralgic character. The appetite is very uncertain; there is often loss of appetite; in other cases the appetite is degraded, and the patient eats the most indigestible things: she eschews meat altogether, and eats pickles, fruits, bits of chalk, etc. The bowels are confined, often obstinately so, and greatly loaded. The stools are often offensive. The tongue is often furred, sometimes even covered with a thick brown fur. It is, however, often clean but pale. The breath is short; the patient is unable to go upstairs or uphill, or to walk any distance, for want of breath. The heart is in a very irritable condition; the least excitement or exertion will bring on palpitation, owing, probably, to the condition of the nervous system and the deficiency in the quality and quantity of the blood. The anæmic person is incapable and disinclined for any exertion; she likes to lie about or sit, does not care about going out, remains in the house, doing nothing but lounging about in a languid fashion. She is drowsy, heavy, and dull. She suffers from great lassitude; she is good for nothing; she is sometimes sick. Owing to the watery state of the blood, all the tissues are in a relaxed condition; nutrition is greatly impaired; the watery part of the blood oozes out of the vessels in the lax or depending part of the body, so that there is slight swelling of the ankles, sometimes of the eyelids. On listening to the heart and the great vessels of the neck, peculiar and characteristic sounds are heard, owing to the thin blood travelling along through the heart and vessels. This sound diminishes in loudness as the patient gets better of the disease, but often does not disappear altogether, or, at least, it may be heard in a slight degree after the patient has gained her usual healthy colour.

This disease is brought on by depressing causes—causes which act unfavourably on the nutritive processes of the body and cause a deterioration in the quality of the vital fluid. Some of these causes are want of food, want of fresh air, bad food, bad air, sedentary occupation, living in warm, stuffy, ill-ventilated rooms, the inhalation of air contaminated with the poison of sewer gas, or other volatile poisons, overwork, etc. Sempstresses frequently are subject to this complaint; indeed, the conditions under which many of them live fulfil to perfection the demands for the production of this disease; but not only those who live in conditions unfavourable to health, but also those

who possess every advantage and comfort may become the subjects of this affection. Without discoverable external cause, with good and plenty of food, with fresh air and change of air, with wealth and comfort, and all the necessities to ward off disease, a member of the family may become the subject of chloranæmia. In such a case the cause may be emotional, but it may be an inherent vice of the constitution. The patient has never been strong, has always been delicate, though never seemingly ill. Still, her constitution has never been robust; and towards puberty, when an extra demand is put upon it, it gives way, and the whole complex machine is thrown completely out of gear. The patient becomes chlorotic because the constitution does not possess sufficient vitality to carry on the nutritive processes with sufficient vigour to meet the increasing wants of the economy. The constitution is not equal to the demands of development and the duties of life. In such cases much may be done by external means and medical and moral treatment. By such means constitutions may be changed and completely altered—the weakly may be made strong, and the sickly healthy; and by such means may the chlorotic be sometimes cured.

When the disease has been thoroughly established, the difficulty of effecting a complete cure is very great. When it has been once apparently removed, it returns again and again; at the same time, by persevering in the use of proper medicines, proper hygienic and dietetic means, the disease may be removed and the patient effectually cured. These means require often to be used for a long time and continuously. Change of air is a very useful agent in the treatment; exercise in the open air is of the greatest importance. Exercise within doors will not do; the exhilarating influence of fresh air is necessary. Walking and riding are most useful, and better than carriage exercise. Change of dwelling is often beneficial. The place of abode may be too low, too damp, or in the neighbourhood of malaria; in such cases it should be changed, and a proper one selected. The food ought to be carefully chosen; no indigestible meat, vegetable, or pastry should be taken. Red meats are better than white; beef and mutton best. Red game may be taken. Fish should not be altogether eschewed, but should be taken sparingly. Good soups are useful, and beef tea better than all. Milk is a most nutritious diet, and proves beneficial in chlorosis; milk puddings may be taken.

The medicines usually given are administered with the object of improving the condition of the blood, of increasing the number of its red corpuscles, its red colouring matter; with this view iron is given after food. One of the best forms of iron is the steel wine, because it is easily digested and absorbed. There are other forms of iron which

are of the greatest utility; for no single form of iron can be taken with benefit for a very prolonged period: the system appears to become accustomed to it, and after a time does not receive that benefit which is expected from it. When this happens, the preparation of iron should be changed; in this way the effects of iron on the system can be obtained for a long period continuously.

Other medicines are given with the same object, such as the preparations of arsenic and manganese, especially in those cases where iron cannot be taken with great benefit.

The bowels should be kept regular. In these cases there is generally constipation, and in some cases obstinate constipation. The motions are often dark and offensive. The liver appears to be acting sluggishly; indeed, the functions of all the organs in the body seem to be less active than usual. In these circumstances a little blue pill at night to act on the liver, and a small dose of salts or a black draught in the morning, give great relief. They lighten the whole system, remove much of the drowsiness, and cause the patient to feel brighter and better. At other times a dose of Pullna water, Carlsbad salts, or Friedrichshall water, two or three times a week, taken in the morning, gives great relief, and keeps the bowels regular.

There are various watering-places, both in England and abroad, a season at which is productive of much benefit to chlorotic or anæmic persons. These places are those where there are two kinds of springs—a saline and a chalybeate. The saline should be taken in the morning on first going there until the bowels have been acted upon freely—it should in most instances be taken every morning for a few days or a week; and afterwards the chalybeate or iron water should be taken two or three times daily after meals, taking care to regulate the bowels by an occasional dose of saline. Iron is liable to cause headache when the bowels are confined, so that the importance of warding off constipation is great; for not only does it interfere with the proper absorption and action of the steel, but it also causes very severe suffering. The chief places where saline and chalybeate springs are found are Cheltenham, Leamington, Scarborough, Carlsbad, Ems, Franzensbad, Homburg, Pyrmont, Schwalbach, and Spa.

Baths are very useful in the treatment of the affection we are now discussing. The action of the skin should be excited. The bath should be taken cold every morning; the patient should remain in the water for at most a minute, and if she does not become warm and feel a glow all over soon after she has come out of the bath, she should only plunge into it, and be then thoroughly well rubbed with a rough towel until she is dry and warm: this should be done always after a cold bath. It makes the skin red, gives a glow over the whole body, makes

the person feel warm—causes, in fact, a healthy reaction. Baths do harm when such reaction is not excited after them.

The patient should have mental occupation given her, for she will find none herself. It should not be of a severe or exhausting character, but light and amusing. It should be just enough to occupy the mind without wearing it. It should be alternated with amusements, change of scene, and all the little things that contribute to make life happy and bright. Depressing influences should be altogether avoided.

No attempt should be made directly to bring back the menses. The treatment must be directed entirely against the general disease. The absence of the flowers is only a symptom of the general condition under which the whole frame labours, and of the influence of which every organ in the body partakes. When this general condition is cured and the disease removed, the symptoms will disappear, and the menses will return and become regular; when, however, this object has been attained, great care will be required to prevent a return of the affection, and a careful watch should be kept on the sufferer, in order to ward off the earliest symptoms of such return.

Again, all diseases which affect nutrition of the body in an unfavourable manner, or cause a constant and profuse drain upon the constitution, may bring about suppression of the menses. Among these may first be mentioned hæmorrhage. Hæmorrhage, in the first instance, causes an actual diminution in the amount of blood in the system, and, at the same time, brings about necessarily a deterioration in its quality—in fact, it causes anæmia; and while this state lasts, and even for some time longer, the menses may not appear.

Long-continued and profuse discharges from any part of the body, such as a chronic discharge of matter from an ulcer, or from an abscess, or from a diseased bone, or an exhausting white or yellow discharge from the womb or vagina, may, by lowering the system, in time bring about amenorrhœa.

Mental disturbance, anxiety of mind, strong emotions of pleasure or of pain, joy, grief, and sudden fright, may cause a similar condition. This is not to be surprised at. The influence of the mind on the body, and on the processes, whether healthy or diseased, which take place in it, is very marked. Emotions will arrest digestion, in some cases give rise to diarrhœa, in others constipation. They often increase the secretion of the kidneys, and sometimes cause a constant desire to pass water. Thoughts of unpleasant things are often most effectual emetics—they cause the stomach to expel its contents in a most sudden manner. The secretions of the stomach and of other organs may be instantaneously and entirely suppressed by a strong emotion. In other cases emotions cause a great increase in the secretion of organs, as that of the lachrymal or tear-forming gland and the kidneys. It

cannot be wondered at that the womb—an organ that is in such intimate sympathy with the other organs of the body—is subject to similar influences, and that emotions may bring about total suppression of the monthly functions of the others, and that it may also, as will be pointed out later, give rise to an increase of the secretion, and to a profuse flow of menstrual fluid.

Diseases of the ovaries is also a cause of amenorrhœa. The exact relation between the ovaries and uterus is not known. What influence the former exert over the latter is somewhat uncertain; it was at one time believed, and indeed is still by a great majority of physiologists, that the ovary is the prime mover in the performance of the monthly functions of the generative organs. This has lately, however, been called in question, and it has been maintained that the womb performs its part of those functions quite independently of any ovarian influence. Whether this be the case or not, it is certain that the ovaries play a very important part in the life and in the formation of the physical and moral character of woman; and when the ovaries are removed by artificial means, or an operation, or by disease, a great change takes place in the subject of such deformity, and one of these changes is suppression of the menstrual discharge. It is stated that this does not occur in all cases, yet the exceptions are so few as not to invalidate the rule. The suppression may take place at the time when the ovarian disease sets in, or may come in after it has progressed some time and involved the structure of both ovaries.

Inflammation in and around the uterus is another cause of menstrual suppression. By this process the ovaries become bound down by artificial bands of membrane, and their activity may become entirely destroyed, and the menses then cease to appear. Tumours of the uterus occasionally bring about a similar suppression.

The *treatment* of these various forms of suppression of the menses varies according to their cause.

Hæmorrhages should be stopped; whatever be their source, this should be our first object. When this object has been attained, the next step in the treatment is to supply the place of the lost blood—to increase the quantity and improve the quality of the vital fluid. The means for effecting this are those for the improvement of the general health—a nutritious, healthy, easily-digested diet; beef tea, milk, red meats, fresh air. A small quantity of wine may be useful if the digestion be feeble.

Profuse and exhausting discharges, chronic abscesses, or ulcers, should be made to heal as rapidly as possible, by appropriate surgical means, and the means already pointed out for the improvement of the general health.

Discharges from the womb and generative passages should be treated

by means of injections. Injections of warm water for the sake of cleanliness, and of astringents, as oak-bark, tannin, alum, or sulphate of zinc, for cure. General treatment in their cure is of the greatest importance. The bowels should be regulated, the digestion seen to, the diet should be good. In spite of all these means, such a discharge may persist. Then further treatment of the inner surface of the womb will become necessary.

A suppression arising from mental anxiety, exposure to cold, etc., requires very careful treatment. It is in these cases that attempts should be made to act directly on the womb; at the same time, violent remedies should not be carelessly taken with that object. It not infrequently happens that with the suppression the general health is disordered. In such cases the general condition should be attended to first. If there should be indigestion, it should be cured. If there be constipation, it should be removed. If the liver act sluggishly, small doses of blue pill may be given. Should the general health be good, attention may be directed to the organs of generation themselves, and medicines administered and means employed directly to bring on the flow. The medicines used for this purpose are mild purgatives—a pill of aloes and myrrh, or aloes and iron, or brisk doses of mercury; iodide of iron has also been given with benefit. Oil of savin, ergot of rye, and cantharides are remedies which are believed to act directly upon the uterus, and to have the power of bringing on the flow when suspended; but their action is such that they require the most careful handling, and they should never be taken except under medical advice. Besides remedies given internally, there are external applications which, when properly used, are of great service in the treatment of this form of amenorrhœa. They are the hot hip bath, placing the feet in hot water, or in hot water containing mustard, large linseed poultices to the abdomen, or a bag of hot salt, sitting over hot water and injections of warm water into the vagina, stimulating liniments to the abdomen and thighs, dry cupping of the thighs, leeches to the womb, the inside of the thighs, or the perinæum. All these remedies are in their turn useful, but each one of them may fail to bring about the desired result; then recourse must be had to other means, or to a combination of two or more of the above at the same time.

Electricity has also been recommended. This is a very powerful agent, both for good and evil. It is a powerful stimulant and anodyne. It is also a powerful destroyer and depressor. It may be applied externally; but when so used it frequently proves of no avail. Instruments have been made to wear in the womb; when placed there they generate a feeble current of electricity, and they are said to have proved effectual in procuring the return of the catamenia in some obstinate cases of amenorrhœa. They are not free from very serious danger.

CHAPTER III.

DISORDERS OF MENSTRUATION (*continued*).

Flooding, or Menorrhagia, Causes of—Fibroid Tumours of the Womb—Polypus of the Womb—Cancer of the Uterus—Ulceration of the Womb—Subinvolution—Good Effects of Nursing—Evil Effects of Over-Nursing—Inflammation of the Womb—Inversion of the Womb—Hæmorrhage into the Tissues in the Neighbourhood of the Womb.

BLEEDING from different parts or organs of the body is of frequent occurrence. Bleeding from the lungs is not uncommonly met with, and then it is said that a "blood-vessel has been ruptured." It is of serious import, for as a rule it is the precursor of a very grave disease called consumption. Bleeding also takes place from the nose, especially in youth and early womanhood. It is said that this form of hæmorrhage is not due to disease, but to rupture of the blood-vessels of the mucous membrane lining the nasal cavity, owing to their over-distension with blood. Hence it is said to be caused by blood plethora—an excess of blood in the system—and that Nature avoids more serious consequences by this simple expedient. Whether this be true or not, it cannot be questioned that in the adult woman—maid or mother—who has attained full and perfect growth, a discharge of blood takes place periodically every four weeks in a healthy manner from the inner surface of the womb. It is a curious fact that all the hæmorrhages above enumerated take place into tubes or cavities which communicate externally. Blood from the lungs is forced into the bronchial tubes, and is expectorated with the phlegm. Blood from the stomach is ejected by the mouth or expelled by the intestine. Similarly hæmorrhages from the nose and uterus are discharged into channels communicating with the exterior. Again, with the doubtful exception of the bleeding from the nose, all the above are the result of disease, but the bleeding from the uterus is the result of health. Though the womb is not peculiar in pouring out blood on its inner surface, yet it is peculiar in the fact that it pours it periodically; that the bleeding is repeated with regularity for a certain period of life; that such bleeding lasts a certain number of days, and does not, as a rule, exceed a certain quantity in any given case; that it does not occur in childhood and infancy nor in old age.

But the amount of the flow may be increased until it becomes profuse, or may even threaten life; or the bleeding may continue without

intermission, or with but slight intermissions, from month to month; or the regularity of the return of the flow may be deranged, and a bleeding may come on at irregular intervals—at intervals much shorter than the typical four weeks.

These symptoms are generally and popularly known as "Flooding." In scientific language two words are used to denote these conditions, according as the bleeding takes place at a menstrual period, or at any time in the intermenstrual interval.

When the hæmorrhage occurs with the monthly flow, or when the menstrual flow is profuse and excessive, the term *menorrhagia* is used to denote it. When it occurs at any time during the interval between two successive month flows it is called *metrorrhagia*.

Flooding may take place at almost any period of life. It sometimes takes place when menstruation occurs for the first time. It may come on, and indeed it is by no means uncommon, at the change of life—during what is called the "dodging-time." It may appear at any time during these two periods, and may occur even in old age, when the monthly bleeding has entirely ceased for many years.

It is always due to disease, and the conditions that give rise to it are very numerous. Some of these are remediable, while others have hitherto resisted the influence of general and local interference, treatment by medicines, as well as operative procedures, while all cause great discomfort, and may prove, if allowed to proceed unattended to, of a grave nature; for frequent and excessive losses of blood must after a time tell upon the system, must undermine the constitution and ruin the health.

The causes of flooding may be divided into local, or those due to the state of the pelvic organs; and constitutional, or those in which the whole system is more or less involved. We shall first of all describe the former, and shall limit ourselves at present to those that are found in the unimpregnated womb, reserving those which occur during pregnancy for future consideration.

FIBROID TUMOURS.—Fibroid tumours of the uterus are, after a certain age, of exceedingly common occurrence. The fibroid is by far the most commonly met with of all tumours that affect the uterus; at the same time that it is the most frequently met with it is also, fortunately, the most innocent in character. They are called "innocent growths," in contra-distinction to "malignant growths," or those of a cancerous nature. When they attack an organ or part, they have no tendency to repeat themselves in other parts or organs; at the same time, a large number of fibroid growths of various sizes may occupy the walls of one and the same uterus. Fibroid tumours may be present

in the womb and give rise to no symptoms, cause no inconvenience, and interfere in no way with the duties of life. This, however, is far from being always the case. Indeed, in many cases, fibroid tumours are a source of great trouble, much anxiety, great inconvenience, and danger. They occasionally, but very rarely, prove fatal. They are met with at all ages after twenty. They are seldom seen before that age, are more common after thirty, and still more so after fifty. They probably begin to grow at the period during which a woman is regular—that is, between fifteen and forty-five. At the same time, it is not proved that they may not originate after this age; it is certain that they continue to grow after this age in some cases. They grow in the womb itself—in the body and in the neck of this organ, more often in the former than the latter situation; in the Fallopian tubes—round and broad ligaments which are attached to the border of the womb; they may also grow in the vagina, but this is not a common seat of fibroid tumours. They are composed of a substance or tissue similar to that which enters into the formation of the womb itself. They are like small local enlargements, or hypertrophies of the substance of the uterus, but they are in some, though not in all, cases separated from the tissues of the womb surrounding them by a case or capsule of tough membrane. It appears, therefore, that they are—though their structure presents a character similar to that of the womb itself—new formations, new growths altogether foreign to the uterus. They are usually of a roundish form, but their shape may be modified by a variety of causes. Several may grow together and form in the aggregate one tumour. In this case the surface would be irregularly nodular, and the general shape would possibly be roundish or indeterminate. Or a single tumour may grow so large as to become pressed upon by the solid and resisting walls of the pelvis, or the bony ring forming the lower part of the skeleton of the trunk, and in this manner receive the impress of that ring.

They vary much in size. They may be as small as a hemp-seed, or they may attain such dimensions as to fill the belly, and weigh sixty or seventy pounds. Tumours of such an immense size are but rarely seen; but every size, from the smallest to the greatest, may be met with.

In the same womb there may be present one or several fibroid tumours. Sometimes the number present is very great; so great indeed that the tissue of the womb itself has almost entirely disappeared, its shape has become hardly recognisable, and but little is visible except a bunch of fibroids. More frequently there is one or, perhaps, two tumours in the uterus. They grow in the substance of the womb; in that of the upper part or body, and in that of the lower part, or neck,

of the uterus. They are seated more often in the former than in the latter position.

The position the tumour occupies in the uterine wall, with regard to its internal and external surfaces, is of great importance. Upon this depends very much the symptoms which are present and due to the tumour; upon this also depends, in a great degree, the method of treatment which should be adopted. There are three positions which a tumour may occupy in the wall of the uterus. It may be close to and beneath the inner or mucous surface—then it is called sub-mucous; it may hold a similar position with regard to the peritoneal or abdominal surface—then it is said to be sub-peritoneal; or it may occupy a place in the middle of the wall—and then it is said to be interstitial. A fibroid tumour of the womb always occupies one of these three situations.

The symptoms of these three varieties are somewhat different.

The Sub-mucous variety, whether small or large, is almost always accompanied by symptoms of a more or less severe character. When even of inconsiderable size, they are accompanied by profuse menstruation, hæmorrhage, and pain. They also give rise, not infrequently, to a profuse yellow or white discharge—the whites.

The Interstitial and Sub-peritoneal forms, when of small size, may give rise to no symptoms, and the discovery of their presence is often a matter of accident. As the tumours grow in size, symptoms appear. These are generally caused by the pressure exercised by the hard and growing fibroid upon the organs in the pelvis, the bladder, the rectum, and the nerves which pass along the wall of the pelvis. The pain caused in this manner may be of the most intense and severe character. It is situated in the bottom of the stomach, on one side or both, extends to the hips, to the back, and down the thighs and legs. It is sometimes like pins and needles, at others a numbness, and occasionally it is of an agonising character. Besides, there may be constant irritability of the bowels, a constant desire to go to stool, a slight diarrhœa, or a constant forcing and bearing down; or there may be difficulty at stool, the bowels may be pressed upon and the canal narrowed, and ultimately entirely obstructed, and complete inability to pass a motion may follow. The bladder troubles are sometimes the most prominent symptoms. The passage of urine may be entirely obstructed, complete retention of urine follow, and artificial aid be necessary to relieve the bladder; or, on the other hand, there may be a constant desire to urinate, and the quantity passed on each occasion amount to a few drops only; or the urine may pass involuntarily, the woman having lost all control over the bladder.

When the tumour is so large as to rise above the brim of the pelvis, it may easily be felt above the pubes by palpitation of the abdomen. It feels hard, smooth, firm, round; or it may be of an irregular shape, as in those cases where the tumour is compounded of several small ones bound together, as sometimes occurs. It may be fixed and immovable, or it may be easily moved from side to side or from above downwards. It may be very tender to the touch, or there may be a good deal of pain in or over it. This is generally due to inflammation of its surface, or rather of the membrane covering it—the peritoneum. In consequence of this inflammatory action, adhesions not uncommonly form between the wall of the abdomen and the tumour; and in this way a tumour which was once freely movable may become firmly fixed.

The Interstitial form of fibroid tumour—that is, a tumour situated in the midst of the tissue of the uterine wall—has a tendency to assume one of the other two forms. It tends towards the inner surface or cavity of the uterus, or outwards towards the peritoneum or cavity of the abdomen; it does not remain stationary. When it approaches the cavity of the uterus it becomes sub-mucous; when the cavity of the abdomen, it becomes sub-peritoneal. Having reached the peritoneum, this outward progress may go on until the tumour is completely outside the wall of the uterus, and attached to it by a little stalk or pedicle only. This pedicle may remain short, or it may become greatly prolonged, so that a tumour of fibroid character may be felt to float apparently free in the abdominal cavity. Indeed, this freedom may be real, for the stalk may actually give way, and the pedicle be detached from all its connections.

Sub-peritoneal Tumours may not only become detached from the uterus, but they may also become attached to other organs in the cavity of the abdomen by adhesions due to inflammatory exudation. In this manner the real nature of a swelling or tumour may be so disguised that it is impossible to recognise its true character.

Fibroid tumours are easily discovered and distinguished in some cases, while in others this distinction or diagnosis is surrounded by the greatest difficulties. In the former case the veriest tyro may discover their presence, while in the latter the diagnosis may baffle the skill of the most accomplished expert. This arises from the fact that fibroid tumours of a certain size, and occupying a certain situation, are unlike any other tumour or swelling occurring in the pelvis; while at another time, being of a different size and in a different situation, they may resemble other swellings to such a degree as to be almost indistinguishable.

Fibroid tumours may be mistaken for several totally different

conditions which occur in the pelvis, as new growths from other organs, as the ovary, and the product of inflammation. Tumours of the ovary sometimes resemble tumours of the uterus in their history, their symptoms, physical characters, as shape, position, hardness, so closely, that the distinction between them becomes impossible. They may also be mistaken for portions of the uterus when that organ is displaced and misshaped, and with other conditions, such as a loaded bowel, hæmorrhage into the neighbourhood of the womb, and so on.

The diagnosis can be made only after a careful examination of the abdomen and of the womb. The examination should be conducted both internally and externally. Some cases can be recognised by an examination through the walls of the stomach alone, but the great majority of cases require for the recognition of the condition present a careful examination of the womb and pelvic contents also.

The history of fibroid tumours is an uncertain one. Sometimes they grow very rapidly, at other times very slowly. They certainly begin, as a rule, between the ages of twenty and forty-five, and their growth is usually most active during this period. After the change of life they have a tendency to decrease in size, or at least not to grow. This rule is, however, not without exceptions, for occasionally cases are seen in which the growth takes place very rapidly after the period we speak of. Sometimes they undergo a process of atrophy—a gradual diminution in size until they entirely disappear. In other cases they become the subject of inflammation, and finally break down, and become converted into an abscess. In a third class of cases they become the seat of a deposition of lime salt, and the tumour becomes ultimately converted into a calcareous stony mass. In this form it may be driven into the cavity of the uterus, and afterwards expelled by that organ through the vagina, and passed externally. These have been called uterine stones. Such calcareous degeneration of fibroid tumours is not very rare, but their expulsion in the manner described is certainly a very rare occurrence. In other cases rapid death of the tumour may happen from some cause or other; it thus becomes converted into a sloughing, putrid, offensive mass. This is a dangerous termination, for absorption of the decomposed mass may take place; the system thus becomes poisoned, pyæmia sets in, and the life of the patient is in imminent danger.

Occasionally the action of the womb itself drives the tumour into its cavity, separates the mass from its attachment, and ultimately expels it altogether, thus effecting a permanent cure.

All the above terminations are, however, rare. The great majority of women affected with fibroid tumour of the uterus go on suffering more or less distress and discomfort from the presence of the tumour

until the change of life. In the great majority of cases the tumours after this period do not increase, and often they actually decrease in size, and the symptoms due to their presence become less distressing.

The treatment of these cases naturally divides itself into two kinds—that for the relief of the symptoms and sufferings of the patient without materially acting upon the tumour itself, and, secondly, that for the removal of the tumour.

In the large majority of interstitial and sub-peritoneal tumours, palliative treatment alone is applicable. No radical cure can, as a rule, be attempted. The evils arising from this sort of tumour consist in displacement of the uterus, pressure on the surrounding parts, and flooding. The signs of pressure have already been mentioned. The displacement of the womb can in many cases be removed, and the distress arising from it be relieved, by elevating the tumour or the uterus and the tumour into the cavity of the abdomen, and taking means to retain it in that elevated position. The tumour should not be allowed to sink into the pelvis, because in that situation it is sure to give rise to symptoms of pressure. The elevated position of the tumour should be maintained by the introduction into the vagina of a suitable pessary, and removing everything that is likely to cause pressure downwards on the womb, such as tight clothing; and by slinging the clothes from the shoulders, or wearing a supporter or suspender for them in the form of a girdle supported by the hips. By these means the effects of pressure may be relieved, or even entirely removed.

The flooding may in most cases be controlled, though only to return again. The presence of the tumour in the uterine wall attracts a greater amount of blood into the organ, and this is a constant factor in producing the symptoms. The uterus is therefore in a state of chronic congestion. This congestion cannot be done away with altogether, but it can generally be reduced in amount. One of the most powerful means for its reduction is rest—absolute rest—in the recumbent position, especially during the times of flooding. When a person floods, she should lie down on a hard bed or mattress. She should be kept moderately cool, and should not be allowed to move out of the recumbent position at all—not even to relieve the bowels and bladder; indeed, everything should be done for her. When rest is insufficient to arrest the bleeding, recourse should be had to medicines. The drinks should be cold—iced if necessary. Cold may be applied to the lower part of the abdomen, and to the private parts; small doses of diluted sulphuric acid may be frequently given, or large doses of the tincture of the perchloride of iron, the extract of Indian hemp, gallic or tannic acid, acetate of lead. These are the drugs usually given by

the mouth, and in the great majority of cases they prove effectual as far as to arrest the bleeding. Should, however, these means fail, local applications become necessary. The vagina should be plugged by a wet bandage, a silk handkerchief, or a sponge; or the neck of the uterus itself may be plugged by lint or a tent. The latter would also dilate the canal of the neck, and thus aid not only in arresting the hæmorrhage, but also in clearing up the exact condition of the inner surface of the uterus. Should these fail, recourse must be had to surgical means. The exact means to be employed depend upon the nature of the particular case, and upon the immediate object in view. These medicines and surgical means can be adopted by a doctor only.

The second method of treatment is for the cure of the tumour, for the removal of it either by medical or surgical means. In the former, medicines are given with a view to prevent the growth of the new formation, to diminish the supply of blood into it, and cause its absorption. In the latter, the removal is effected by operation.

ATTEMPTS AT REMOVAL OF THE TUMOUR BY ABSORPTION.—Absorption is the process by which the veins and lymphatics take up material brought into contact with them, carry it away, and circulate it through the body. Attempts have been made at all times since these tumours have been known to effect their absorption by the administration of medicines. Sometimes success is obtained by their use, but this is rarely the case. Usually they appear to have little or no action on the size or the growth of the new formation. The medicines used and generally recommended with this object are iodine and bromine and their salts, iodide of potassium and bromide of potassium and of ammonia, arsenic, lead, and phosphorus.

Another method appears to promise more success, and that is the injection under the skin of ergotine—the active principle of ergot of rye. Ergot of rye is well known as a potent drug, having direct influence on the tissue of the uterus during pregnancy, and it is believed to act in a similar manner on the unimpregnated organ. For this reason it has been used to destroy fibroid tumours. It is, as has been already said, injected under the skin; it is absorbed into the circulation, acts upon the muscles of the uterus, and compresses the vessels in its walls. In this manner it diminishes the supply of blood into the tumour, and when the supply of blood is cut off from a part or diminished, the nourishment of that part is cut off or diminished. The consequence of this is, that the tissue of the tumour begins to undergo degeneration, a formation of fat takes place in it, this is in its turn absorbed, and the tumour consequently diminishes in size and substance. It undergoes a process of atrophy. This process is

occasionally associated with some inconveniences from the peculiar effects of the ergot on the general system, from the abscesses which occasionally follow in the places where the injection was made, as well as from the pain which arises consequent on the muscular action called forth in the uterus.

Salts of lime have been used with a view to cause a deposit of calcareous matter in the substance of the tumour, and in this manner check its growth. The chances of success are slight, and the evil effects of the lime salts on the general system forbid its use, except in a few cases, and under the most careful supervision.

For some years the attention of physicians and surgeons has been directed to the surgical treatment of these growths, and has been attended with a fair amount of success. The number of cases, however, suitable for surgical interference is comparatively small, but some cases of a desperate character—cases in which no hope could be held out, except by removal of the tumour by surgical means—have by those means been rescued from their peril, and restored to health. There are various ways in which the removal of such tumours can be surgically effected. The means employed would depend on the character of the subject, the size, the situation, and the surroundings of the tumour. As a rule, these operations are attended with great difficulty, and, moreover, they are not free from danger. Still, great success has attended some of the most formidable operations, even in the most desperate cases. Such cases do not often occur, but when they do, surgical means are the only ones which hold out any hope of prolonging life and of restoration to health—and rather than meet a premature death, art should be allowed to interfere to save the threatened life. Such cases are amongst the greatest and most dazzling triumphs of modern surgery. When hope fails, and death appears to approach to seize its victim, the surgeon's knife steps forward into the arena, snatches the victim even from the grasp of the foe, and restores her to her friends, and gives back to her health.

Polypus of the Uterus is another not uncommon cause of flooding. A polypus is a tumour growing from the inner surface of the uterus. Polypi may be attached to the uterine wall by a stem, and then they are called pedunculated; or may be attached directly to the wall of the organ without the intervention of a pedicle, and then they are called sessile. They differ much in size, sometimes being no larger than a pea, at others as large as a melon. Their structure depends to some extent on their origin. They vary much in consistence, some being hard and firm, and others soft and gelatinous.

The hard or fibroid polypus is similar in structure to a fibroid tumour; indeed, it is often only a later stage of the latter. The

fibroid tumour is constantly subject to the action of the contracting uterus. In this way there is a tendency to drive the tumour into the abdominal or uterine cavity; if it be driven in the latter direction it becomes a polypus. This polypus is at first sessile; it has no pedicle, and indeed projects but slightly into the uterine cavity, but after more or less time the continued expulsory action of the uterus drives it farther and farther from its original seat, and the polypus becomes pedunculated; later it often is driven out of the cavity of the uterus into the vagina and may ultimately be separated altogether. This form of polypus usually grows on the upper part of the uterus, but it occasionally grows from the neck or lower part.

The soft or gelatinous polypi are usually very small, and never attain a great size. They are enlargements of the glands of the mucous membrane of the lower part of the womb. They are supplied with a large quantity of blood, and are usually congested through pressure. They grow from the canal of the neck of the uterus.

PLACENTAL POLYPUS.—Sometimes portions of the after-birth, or placenta, are retained in the womb after labour or miscarriage, and these become organised, attached firmly to the wall of the uterus, and live. This kind of polypus is intermediate in hardness between the other two. They have, of course, a structure similar to that of the after-birth itself, with varying proportions of blood. These may remain in the uterus for a very long time, even years.

There are no known causes of polypus except the last-named.

SYMPTOMS.—The most prominent symptom of polypus of the uterus, and the symptom which first directs attention to its presence, is flooding. At first this may happen only at the time of menstruation—the flow being profuse, clotty, and prolonged; but after a time, floodings appear at any time during the intermenstrual interval, and often they last for weeks. During the intervals when the patient is free from hemorrhage there is a profuse white, yellow, or watery discharge. Sometimes this discharge has a very offensive odour, and causes a suspicion of cancer. There is pain in the back, bearing down and sometimes violent pains like the pains of labour, bearing down and forcing in the bowel; there is a continual desire to pass water, and often forcing in the bladder.

In the majority of cases the doctor has no difficulty in recognising the presence of a tumour of this kind. Sometimes it is driven outside through the vagina, and hangs by a thin fine stem only; then it is easily seen. In other cases an examination will reveal the nature of the case. The womb is enlarged, the mouth of it is open, and the

tumour projects into the vagina, or, if lodged in the uterus, it may be felt with the finger. In some cases, however, the mouth of the womb has not been sufficiently dilated to allow of exploration of its cavity; then it becomes necessary to effect such dilation before the nature of the case can be properly made out. When the polypus is small it may escape detection, even though every means at our disposal be employed.

Polypi are sometimes entirely expelled, and Nature effects a complete cure; in other cases they become calcified, or inflammation and mortification set in in the growth and it perishes; or absorption of the fœtid products may take place, and the patient becomes affected with blood poison. Their course, however, unless interfered with, is one of prolonged suffering and ill-health. The constant drain upon the constitution from the bleeding and the leucorrhœal discharge exhausts the system, and may bring on permanent disease.

There is but one way of dealing with these growths, and that is to remove them. When flooding has been taking place for a length of time, the cause of it should be definitely ascertained; and if that cause should be polypus, it should be at once removed. There are safe ways of doing so without incurring the risk of bleeding, and indeed without incurring the danger that may arise from the presence of the tumour. The cure is permanent.

CANCER OF THE WOMB.—We enter now upon the consideration of one of the most awful of the diseases to which the human frame is subject. It is regarded with fear and dread by all, on account of its malignant and fatal character. It is a disease which may attack almost any part of the body, and in a very large number of cases it proves fatal; while in others—but unfortunately the few—it may be entirely removed and eradicated. The cases in which the disease is curable consist of those where it has attacked parts of the body which can safely be removed by operation. When it attacks the womb, it is usually that part which is easily reached, which is not essential to life, and which may safely be cut off. It attacks the mouth of the womb. It is but rarely—very rarely—that the original seat is in the body of the organ.

Cancer is a disease of old age, or at least of the time of life when the nutrition of the tissues has become less active and is on the decline. It is met with usually between forty and fifty years; at the same time it may be seen in old people and in young children. It is, however, a very rare affection in children; and when seen in them it runs its course and proves fatal with great rapidity; while in old people its course is slow, and its duration more prolonged. The causes of cancer are unknown. It is believed to be hereditary; it is transmitted from

parent to offspring. If the parents have suffered from cancer, some of the children may suffer in a similar manner. When the constitution of cancer has been inherited, slight causes are said to bring on the disease, such as blows and slight injuries.

Cancer of the womb occurs more frequently in the married than in the single, in those who have had children than in those who are barren, in those who have had many children than in those who have had few; so that it appears that fecundity, and the process of bearing and giving birth, seem to favour the development of this disease. Cancer is not contagious. It cannot be transferred from one person to another by contact; it cannot be communicated to another person.

There are several forms of malignant disease of the womb which have been usually classed under cancer. Some of them are very rare, as the hard cancer. This, though met with frequently in other parts of the body, rarely affects the uterus. The forms usually met with in the womb are the cauliflower growth of the neck, or the epithelial variety, and the encephaloid.

Both these varieties form tumours, the latter in the neck of the womb, and the former attached to it like a cauliflower mass, as its name implies. The encephaloid is hard, irregular, or nodular, growing in the cervix, and not attached to it. The cauliflower mass is soft, spongy, and breaks down easily. These diseases are characterised by rapid growth. They increase quickly in size. In the early stages of their existence they appear to be limited to the neck of the womb, and may be removed entirely. This is especially true of the cauliflower growth. It rapidly extends, however—a few weeks or months suffice for it to spread to the neighbouring parts. The vagina, the rectum, and the bladder become involved. Soon the mass begins to break down and mortify or slough. When this takes place, shreds are passed and an ulcer is formed in the womb. Ulceration goes on and involves the surrounding parts; the bladder and rectum may be opened, and the whole or nearly the whole womb eaten away.

The symptoms of cancer may show themselves at a very early stage of the disease, or they may not appear until the disease has existed for a long time and made serious progress. One of the first symptoms which usually attracts the attention of the patient is a flooding. This sometimes comes on early, before ulceration has taken place, and it may be very considerable in amount, or it may be a constant pinky discharge. Before this appearance of the flooding or discharge of blood there has been usually a little white, or yellow, or watery discharge, but often in such small quantity as to be considered of no importance. When a profuse flooding, or a constant pinky discharge is present, attention is directed to it, and advice sought.

After this there is usually an abundant watery, gummy discharge. This comes on when the tissues begin to break down and ulcerate. The discharge often contains shreds of tissue, clots of blood, and is exceedingly offensive and irritating. The foul smell it possesses sometimes makes the patient a burden to herself and to those near her. This is occasionally the chief cause of complaint. This discharge causes irritation of the external parts, and may give rise to the most obstinate itching.

Pain is another symptom of cancer. It is present in some cases from the first, while in others there is but little pain throughout the whole course of the disease. The pain is in the bottom of the stomach, and is of a gnawing, stabbing, or lancinating character. It is sometimes constant and severe.

When ulceration has begun, the disease makes more rapid progress. The discharge becomes very profuse, there are frequent floodings, and constant watery or serous discharge. These losses weaken the patient, and undermine the constitution. She loses flesh, and loses it rapidly, becomes thin, and occasionally very thin; a peculiar tint of skin soon appears, a slight yellowish-green colour. This appearance, when well marked, is almost characteristic of cancer. When the disease has extended to the neighbouring tissues or the glands of the pelvis, the broad ligaments of the uterus and the ovaries, a tumour may be felt in the bottom of the stomach. The disease having invaded the peritoneum, causes inflammation of that structure, and gives rise to pain and tenderness.

When the ulceration has extended to the bladder and rectum, the contents of those organs are forced into the vagina, entailing the greatest misery upon the sufferer.

Cancer can with care be readily recognised by a doctor, but there are some forms of disease with which it is occasionally confounded, such as polypoid and fibroid tumours and certain ulcers, together with papillary growth of the neck of the womb.

Few cases of cancer recover. Rarely Nature alone effects a cure. If the disease be recognised in its early stage, there is no doubt that removal is the best method of treatment, and the only one that should be adopted. It admits of no delay. The case may be suitable for operation to-day, when it may be possible to remove it entirely, but in a week or in a month other tissues may have become involved, so that it is impossible to remove the whole of the affected tissues. When this is the case, the treatment can be only palliative. The pain should be relieved by narcotics. Strict cleanliness should be enjoined, so as to remove all discharges, and for this purpose an injection containing some disinfectant, as carbolic acid or Condy's fluid, may be used. The diet

should not be too full. Rest is necessary, for motion frequently brings on flooding. It may be advisable to remove as much of the growth as is possible, with a view to check the bleeding. In this case astringent pessaries made of tannic acid and cacao butter will for a time effect this object. Nothing, however, can arrest the progress of the disease, yet removal of a part of it may so far palliate the symptoms as to render life tolerable. The disease brings with it occasionally a train of complications, such as inflammation round the womb, inflammation of the abdomen, poisoning of the blood, dropsy of the kidneys, which, inasmuch as their cause cannot be removed, must be permitted to run their course. The only help that can be rendered is that for the relief of pain, to prevent flooding and fever, and to keep up the strength.

ULCERATION OF THE UTERUS.—Ulceration of the womb is an affection said to be of very frequent occurrence, and a great number of the troubles from which women suffer have been ascribed to it. The part of the womb affected by ulceration is that which projects into the vagina, and is called the cervix. The term ulceration is applied to true ulceration where there is destruction of tissue, and also to another condition, where there is only removal of the thin layer of cells covering the part—of the epithelium. The latter condition is a very common one, while the former is of much greater rarity. Indeed, abrasion of the epithelium covering the lips of the uterus is found in all cases of long-standing uterine disease. It is most marked usually at the edges of the orifice of the uterus, but it may extend for some distance over the lips and up into the cavity of the womb. It is often very slight, and it may be difficult to say whether it is really present or not. It presents to the finger a soft velvety feel, and to the eye a red or dark-red congested appearance. In most fairly marked cases this condition can be readily diagnosed by the finger alone. This ulceration is said to give much trouble, and to prolong and aggravate other uterine and ovarian diseases. They tend to keep up congestion of the womb, and in this way give rise to a constant discharge of "whites," and frequently to floodings. The patient also suffers from pains in the back and bottom of the stomach—a constant aching. The pains and the losses of blood and whites keep up a constant feeling of discomfort and uneasiness, and together reduce the strength and depress the spirits of the patient, until often she feels unfit for occupation of any kind.

The causes of this condition are sometimes somewhat obscure, but may often be discovered and removed. The bad state of general health, or a derangement of the whole system, may give rise to abrasions of the womb. In these cases the treatment should be general

and local. The strength of the patient should be improved by tonics, as quinine, iron, bark, mineral acids. The bowels should be regulated by mild laxatives. The dyspepsia from which these patients so frequently suffer should be removed by regulating the diet and by appropriate medication. The food should be of a nourishing character—milk and a fair amount of animal food. Stimulants should be taken sparingly, or not at all, unless absolutely required to improve the condition of the stomach and favour digestion. When required, they should consist of sherry, or a little weak brandy and water. But again it should be said that it is better to avoid them as a general rule.

The question of exercise is one on which opinions differ considerably. Some believe that absolute rest is required, while others advise exercise in the open air. This question can only be decided for the particular case. No general rule can be laid down with regard to it, except, perhaps, that when the patient feels equal to taking exercise in the open air she should do so. Not the ulceration only, but the complications which accompany it, give indications of the necessity for taking or refraining from exercise. The local treatment consists, in the first place, in cleanliness—in injections of simple warm water night and morning. This removes the secretion—which is occasionally very irritating—from the part, and gives a fair chance for the *vis medicatrix nature* to effect healing of the sore. Frequently, however, other means are necessary, such as alum or sulphate of zinc in the water injection. The astringent action of these substances tends to diminish the size, or to contract the vessels of the part, and thus to relieve the congestion. In some cases bleeding is performed—a leech is applied to the womb, or a few punctures are made in the lips of the cervix by means of a short lancet. Other cases are treated with lunar caustic—the solid nitrate of silver—or by other stronger and more powerful agents. These latter are very powerful caustics; they destroy the unhealthy tissues for some depth, and when the dead tissue which forms in consequence falls off, a healthy surface is found beneath. This, after a time, gradually heals, and the epithelium forms over it.

True ulceration—that is, destruction and removal of something more than the epithelium on the surface, the destruction of an appreciable thickness of the tissue of the cervix—is much more rare than simple abrasion.

This form may affect every part of the cervix, or it may be limited to the margins of the uterine orifice. The ulcer is of an irregular shape, and presents a granular uneven appearance; or it may be covered with a greyish or yellowish substance. The cervix of the uterus is red, swollen, and congested. This congestion extends through the whole of the womb, and even to its appendages. There is an abundant

discharge from the womb, of a yellowish colour. There is a pain and a feeling of uneasiness in the pelvis, a bearing down and aching in the back. Sometimes the diseased part causes more or less profuse hæmorrhage. There are frequent attacks of floodings. The general health suffers in consequence. The patient becomes pale and nervous—often hysterical. The stomach becomes deranged, the appetite is lost, the bowels confined. The patient becomes weaker; she complains of headache and pains here and there over the body. She gives up taking exercise, feels unfit for exertion, and becomes a confirmed invalid, and is confined to her couch.

The treatment is much the same as that for simple abrasion.

RODENT ULCERS.—This is a disease of a much more severe nature than the two former. It partakes of the character of cancer, inasmuch as it is malignant. Like malignant disease, it is rarely, though it is occasionally, met with in the young. It is a disease which makes slow progress. It is much less rapid in its course than true cancer. It affects the neck of the womb, and may extend along the surface, healing at one part while extending at another; or it may eat deeply into the substance of the uterus.

The treatment consists in keeping up the general health—cod-liver oil, iron, rest, good food, and hip-baths. Strict cleanliness should be enjoined, for the discharges are of an acrid character. If there is pain, anodyne injections or pessaries containing opium, morphia, or belladonna, should be employed under proper advice.

SUBINVOLUTION OF THE WOMB AFTER DELIVERY.—During pregnancy the womb enlarges to several times its size in the virgin state. After labour it weighs about a pound and a half, or even more. The process by which the organ is reduced to its original size is called “involution.” This process should be accomplished in a month, or at most six weeks, after delivery. Sometimes it fails, or takes a longer time than usual; then involution is said to be impeded, and the womb to be in a state of “subinvolution.” This is a condition very frequently met with, especially in the poorer classes of the inhabitants of large towns, as well as in those who live in luxury and ease.

Involution is accomplished in part by the muscular contractions of the womb itself, in part by absorption of the fat formed in the degenerated elements of the uterine tissue, in part by the discharge which escapes from the organ after delivery. Whenever any one of these three factors is interfered with, involution fails. There are numerous causes which arrest the proper changes in the womb after delivery, and give rise to subinvolution.

Amongst these the state of the general health plays a very important part. All exhausting diseases—as disease of the lungs, liver, or kidneys, fevers, scrofula—give rise to a general want of power in the system, a want of muscular power; the muscular system does not act with the vigour met with in health, and in such circumstances the womb after delivery acts in a languid and feeble manner. This permits the organ to remain larger, less firm, and more flabby than natural; a greater quantity of blood is allowed to circulate, or, rather, to stagnate in it. This is in a high degree unfavourable to the occurrence of rapid healthy changes, and the consequence is that involution goes on slowly and imperfectly; the womb remains larger than it should be, and a low form of inflammation of the womb, with an abundant white and yellow discharge flowing from the organ, is the result.

During labour the neck of the womb is pressed upon by the head of the child, and in all cases that part is more or less bruised and lacerated. This natural condition greatly favours subinvolution, because it is a source of irritation, and tends to attract an increased flow of blood through the organ.

Rest is one of the most powerful agents in the treatment of disease, one of the most valuable aids in bringing about healthy changes. In the form of sleep it has aptly been designated “Nature’s sweet restorer.” The expression may not inappropriately be extended to all forms of rest, physical, mental, or functional. After the functional activity of pregnancy, the physical activity of labour, and the mental excitement associated therewith, rest—absolute rest of mind and body—is a most imperative want. Rest in bed for at least a fortnight should be enjoyed by every young mother, and rest on the couch for a second fortnight. By this means alone many of the evils which follow pregnancy and labour may be avoided. Want of rest, too early getting up, and excitement are among the most common causes of subinvolution and the evils which follow it.

Want of food acts as a cause of arrest of involution in numberless cases amongst the poor of our large towns. They go for days during pregnancy without meat of any kind, and perhaps taste fresh meat once only in a week or a fortnight; and when their time of travail comes, it proves also a time of partial starvation. They have not the necessaries of life, much less the little delicacies which are acceptable to a woman at this time. Not only do they suffer from want of food, but want of rest comes in to aid it in its injurious influences, and the two are sure in their effects. This accounts for the exceeding frequency with which subinvolution is met with in the class of people named. Supply them with sufficiency of food, and the improvement in the condition of the sub-involutéd womb is marked and rapid. Fibrous

tumours, polypus of the womb, and flooding—the two former uncommon, but the latter a frequent cause of imperfect involution—give rise to permanent enlargement of the womb. The two former are rare causes of this disease, because it is not common for a woman who suffers from either of them to conceive or become pregnant. Flooding after delivery, however, is a frequent occurrence in the weakly, and a prolific cause of uterine disease.

Inflammation of the womb, or of the tissues surrounding the womb, sets an effectual stop to the changes which naturally take place in the recently emptied uterus.

The sympathy between the breasts and the womb is at all times manifest, but during pregnancy and after delivery in a more marked and palpable manner than at any other period. The secretion of milk and the act of suckling are favourable to the natural changes which take place during the lying-in month. Indeed, nursing is the most healthy stimulus to involution of the uterus; and it is an unfortunate occurrence when the breasts refuse to perform their natural function of secreting milk. Under such circumstances recovery is more tedious and less complete than when the breast functions are naturally performed. How much more injurious must it be, then, when the breasts act healthily and vigorously, secrete abundance of natural food for the infant, but the mother refuses to perform her duty! There is no doubt that the neglect of maternal duties in respect to suckling is a prolific cause of disease of the womb. On the other hand, nursing may be overdone. It is not uncommon to see strong and healthy countrywomen nursing their children for two or even three years, and it does not appear to do them any harm; but this is owing to the native strength of their constitution, to the fresh air which they breathe, the plain nourishing food which they take, and the regular habits which they practise. Without all these it would be impossible for them to nurse for such a time without any grave and serious effects. The inhabitants of towns when they nurse for a long period—as they occasionally do—pay the penalty after the next pregnancy. Their system is soon enfeebled and exhausted. They cannot bear a prolonged drain upon it, and subinvolution and uterine disease is the inevitable result.

Subinvolution gives rise to pain in the back, bearing down on the pelvis, a feeling of exhaustion and languor and lassitude, inability to walk, and unfitness for exertion. There is usually profuse whites and often profuse menstruation, or flooding. With these symptoms are frequently associated others due to the general state, as headache, giddiness, extreme general weakness, pains in the side, shortness of breath, palpitation, constipation, etc

The treatment of this affection when undertaken early is favourable. It can, as a rule, be easily cured. If, however, it be allowed to go on unattended to for months or years, then changes take place in the womb, which will remain more or less permanent in spite of all treatment. Hence the importance of early attention in those cases where the recovery after delivery has been imperfect.

The first requisite for cure is rest—especially after labour—rest in the recumbent posture. A good, plentiful, nutritious diet should be given. A little wine is very useful to help digestion in these cases. The bowels should be kept regular, and twice a day injections of warm or cold water, according to the nature of the case, should be made into the vagina. Tonic medicines are necessary to improve the blood and strength; bitters, or acids and bitters, to improve the appetite; then steel, or steel and quinine, will prove of great benefit. Should there be any active cause of the condition, as nursing, it should be stopped at once. If the discharges from the vagina be profuse, they should be arrested by injections of astringent substances, as decoctions of oak-bark, tannin, alum, etc. There are some medicines which act directly on the womb, and these prove occasionally useful. Of these, the best, and the one usually given, is ergot of rye. It should be given in combination with iron. It is hardly necessary to add that fresh air and healthy surroundings are essential to a rapid recovery. As soon as possible the patient should go for change of air and scene. This acts most beneficially upon the general health, and thus improves the tone of the whole of the muscular system, and favours involution.

INFLAMMATION OF THE WOMB.—Any part of the womb may become the seat of inflammation, the abdominal surface, the internal surface, or the whole tissue of the organ. It may be brought on suddenly, and then is said to be acute. This happens more frequently after labour than at any other time; indeed, acute inflammation of the virgin womb is of very rare occurrence; and when brought on, is due to foolishness or negligence. Its causes are suppression of the menses through exposure to cold at the time of menstruation, the use of cold or astringent injections at or about the time of the menstrual flow, and injuries from falls, blows, etc. The two first causes may, and ought to be, entirely avoided. A woman ought to know the time of the appearance of the menses, she should not be taken unawares, and should be prepared for their appearance. Unfortunately, however, the slight care and observation required for this is frequently not taken, and some, but by no means all, have to pay the penalty of carelessness in acute suffering.

The symptoms are stoppage of the flow, shivering, heat and pain in

the pelvis, pain in the back and thighs, bearing down, distension of the abdomen. There may be high fever, sickness, nausea, and painful micturition. The inflammation extends in some cases from the womb to the bowels; then there is great fever, acute pain, severe sickness, distension of the abdomen, shortness of breath, drawing up of the knees. The least movement of the patient, or the least pressure on the stomach, gives rise to the most intense suffering. This is a very dangerous disease, and may prove fatal.

TREATMENT.—Medical advice should be sought without delay. Meanwhile, hot applications, as linseed-meal poultices or fomentations, should be applied to the abdomen, injections of warm water to the vagina. The further treatment of the case depends upon the symptoms present. In some cases leeches or gentle purgatives may be needed. In others warm hip-baths, and in others leeches to the abdomen and fundament; while in some cases opium is of the greatest use. But inflammation of the womb does not always come on suddenly. It comes on insidiously, and the sufferer is not aware of it until it has existed for some time and has become thoroughly established; or, having set in as an acute attack, it does not entirely pass off, but slides into a milder form, which remains for a longer or shorter period. It is then called chronic inflammation. At first this form, when it comes on insidiously, gives rise to few, if any, symptoms. It is certain, at any rate, that these are so slight that they do not attract the attention of the woman. One of the first things that excites suspicion of something wrong is a leucorrhœal discharge—the “whites”—and this is allowed to go on without treatment for months or even years. This discharge may be viscid, sticky, transparent, like white of egg; or it may be a thick, yellowish, or greenish fluid, like matter; or it may be a thin, watery, pale fluid, having most irritant properties—giving rise to inflammation and excoriation of the external parts and upper parts of the thighs. Just before and after the monthly flux the discharge may disappear or be greatly increased in quantity. The menses may be accompanied by much pain, the discharge being profuse and clotty. In time the wound becomes tender, increases in size and weight, and sinks in the cavity of the pelvis. There is a feeling of heat and pain in the bottom of the stomach, bearing down, and a sense of fulness, dragging in the back, loins, and thighs, and sometimes sharp pains in the womb itself. The bladder also suffers; there is pain, and constant desire to pass water, sometimes there is difficulty in micturition. The bowels suffer in a similar manner; there is a forcing in that situation, frequent desire to go to stool, and pain with it. Walking becomes painful.

In course of time the general health suffers, the appetite fails, vomiting sets in, the bowels become constipated, there is headache, giddiness, pain in left side, and deterioration of the blood due to imperfect action of the stomach. Menstruation becomes painful and profuse, general nervous symptoms set in, neuralgic pains in various parts of the body, and confirmed hysteria.

The causes of this condition are, in the first place, those which produce the acute form—exposure to cold during a menstrual flow, either from washing in cold water, getting wet, or getting the feet wet, or simply insufficient clothing; irregular appearance of the menses seems to give rise to it also; over-exertion during the menstrual flow; displacements of the womb, abortions, miscarriages, and labour, and the subinvolution which follows them.

When attended to early, the disease is easily cured; but in most instances, as is usual in diseases of the womb, it has existed for a long time before anything is done to alleviate or cure it. Indeed, owing to the insidious manner of its early course, it is often not possible to take it at the start, and consequently treatment is often required for a long period. One of the most important agents in the treatment is rest. The sufferer should lie in the recumbent posture. It is not necessary for her to lie in bed, but she should be moved during the day from the bed to the couch. She should not stand on her feet or walk about—this always aggravates the suffering. The bowels should be well regulated. Nothing is better for this purpose than saline aperients. Epsom salts are perhaps the best of all. They tend to relieve congestion. They can be regulated according to the patient's wants. The taste is offensive, but it can be pretty well disguised by the addition of a little syrup of lemon. Mineral waters are of service, and a sojourn in one of the English or foreign watering-places will in some cases effect a cure. The diet should be good, nourishing, easily digestible. Malt and spirituous liquors, or wine, should be avoided, or taken sparingly, as they seem to have an unfavourable influence on the congested womb. Light wines are the best when necessary. They should be taken for the sake of the digestion only; when the stomach performs its work efficiently they should be avoided. Unfortunately, it is rarely that the digestion is good, especially when the disease has lasted some time, and the use of wines becomes then necessary.

There is no medicine which has a direct and specific influence on the inflammation. But the general troubles associated with the condition should be met by acids and bitters, or, in some cases, soda, with bitters to improve the appetite, and then by tonic medicines to improve the state of the blood. Quinine, gentian, calumba, and iron are all useful in their turn. Local treatment is also usually necessary

in these cases. Leeches to the fundament, or to the womb itself, or the withdrawal of a little blood from the uterus, applications of caustics, astringents, absorbents, or alteratives to the neck, or to the interior of the womb, may become necessary. Injections of hot or cold water, according to the individual case, may prove useful; or, if there be pain, injections of solutions containing soothing or anodyne substances, as opium, or pessaries containing opium, henbane, or belladonna. None of these, however, should be used except under medical advice.

INVERSION OF THE UTERUS.—In this disease the womb is turned inside out, and lies in the canal of the vagina, or projects outside the vulva. It may be complete, or only imperfect. It is a rare affection, and is usually brought about suddenly after labour, as the after-birth is born, or gradually through a dragging on the inside of the organ by a polypus attached to it. When it comes on suddenly, as after labour, the patient has pain, feels faint, violent flooding sets in, the patient becomes collapsed, and, unless relieved at once, death may ensue. When it comes on gradually, it is due to the expulsion of a polypus, and consequent dragging on the womb. Then there is flooding, occasional or continuous; pain in the back, loins, and pelvis; walking is difficult; pain and difficulty at stool and in making water. When these symptoms have lasted some time, the constitution begins to sink. The continual loss of blood and pain depreciate the state of the blood, the appetite fails, the woman becomes pale, thin, and suffers from all the evils attendant upon a watery condition of the blood.

The condition of the womb can be recognised only by a careful examination of the organ.

When the womb is inverted suddenly after labour, attempts should at once be made to return it to its proper position, and in most cases these are successful. Even when it has been out of position for a long time, similar attempts with the same object should be made. In the latter case, however, there are many difficulties to be overcome, for the organ has become reduced to nearly its usual size, and its tissues have become hardened, and consequently the resistance to re-position is very great. By long patience, however, and by pressure exercised on the inverted part for a protracted time, these difficulties have been overcome in some cases which had appeared hopeless. This has been accomplished by the introduction of an elastic ball into the vagina, which, after its introduction, was distended with air, and the exercise of continuous elastic pressure on the inverted part ultimately caused it to resume its natural position. Reduction of the inverted womb usually demands the greatest skill.

When this has quite failed, the bleeding which takes place from the inverted surface should be checked. The whole of the tumour should be bathed in an astringent solution, as of alum, tannin, acetate of lead, and surrounded with strips of lint soaked in one of these solutions; or in some cases strong caustics may be used, and it is said that these not only check the hæmorrhage, but reduce the bulk of the inverted organ—a result greatly to be wished.

When the inverted womb cannot be returned, and when the hæmorrhage becomes so obstinate as to threaten life, then, as a last resort, the organ has to be removed. This operation has been performed several times with success; at the same time it is fraught with such danger to life that it should be resorted to only as a last chance of prolonging life.

HÆMORRHAGE IN THE NEIGHBOURHOOD OF THE WOMB, INTO THE CAVITY OF THE BELLY, OR INTO THE TISSUES.—Blood may be poured out in this situation from a number of sources. It is due generally to rupture of some small blood-vessels, or to blood disease. It usually happens between the age of fifteen and forty-five, more often about the time of menstruation than at any other. Pale, weakly women and stout women are said to be more liable to it than others. It is caused by violent efforts at the time of the menstrual flow, violence from falls or blows, and disease giving rise to an impoverished state of the blood.

It begins usually with a heavy dull pain in either groin, and a profuse menstruation or flooding. The menstrual flow often lasts a much longer time than usual. Then a sudden sharp severe pain is felt in the bottom of the stomach, the woman turns pale, faints, and becomes cold; soon she vomits. If this happen during menstruation, the flow may be completely arrested, or a profuse flooding may set in. There is bearing down in the pelvis, and forcing in the bladder and bowel. Sometimes there is difficulty, or even inability, to pass water or stool. The patient has a sense of weight in the bottom of the stomach, as if a heavy body were present in that situation. The abdomen becomes blown up with flatulence.

These symptoms pass off after a longer or shorter time, and symptoms of reaction set in. From the loss of blood and the sudden shock, the patient is naturally weak and exhausted. She is pale, often extremely pale—blanched. She soon becomes feverish, she is chilly, or may have slight shivering, the skin is hot, there is thirst. The tongue is foul, and the mouth dry. The bowels are confined, in some cases obstinately so, owing to the obstruction caused by the pressure of the effused blood on the bowel. There may be frequent desire to pass water, or entire suppression. The bleeding is in some cases so great as

to give rise to a tumour extending up as far as the navel. This is smooth, with usually an uneven upper border. There is pain and tenderness over the lower part of the belly.

It is a disease which rarely proves fatal. Most cases recover, though in some bad cases death has resulted from the loss of blood.

TREATMENT.—When the symptoms first set in, perfect rest should be at once secured. The sufferer should lie on the back in bed, and cold be applied to the lower part of the abdomen. Should there be any sickness, ice should be sucked. If the sufferer be very faint, stimulants should be administered, as champagne, brandy, or ammonia. Medical advice should be sought at once. Opium is of great service in this condition, but it is a drug that requires great care in its administration. When the stage of hæmorrhage and collapse is over and reaction has set in, the worst is generally past, though the illness may still prove protracted; yet there will be but little doubt as to the issue, provided the patient submits to be treated. Rest is a most essential condition of rapid recovery. A quantity of blood, varying in amount has been poured out of the vessels, and this is to be absorbed. This is a slow process, but it is surprising with what rapidity it will go on under favourable conditions. Rest is necessary not only to favour absorption, but to prevent inflammation and a further pouring out of blood by disturbing the parts. Movement may cause a considerable increase in the size of the tumour formed by the effused blood, and it may do this at any part of the process of recovery, and therefore rest should be secured with scrupulous care. This alone is in some cases sufficient treatment. Others require both local and general means to ensure a rapid recovery. Counter-irritation of the lower parts of the abdomen, by means of blisters or of a solution of iodine, is of great use. Both these act favourably in dispersing or in exciting absorption of the hæmorrhagic tumour. Blisters should be frequently repeated, and allowed to heal rapidly, or if a solution of iodine be preferred, the skin should be constantly kept sore with it. Sometimes the tumour, instead of becoming solid, remains fluid, or forms an abscess. In such cases it is not unusual to open it, and make an exit for the fluid or matter it contains.

The diet should be good, easily digestible, and sufficient. A little stimulant is useful—a small quantity of wine or brandy. Tonics, after the febrile condition has passed, are administered with a view to improve the stomach, the blood, and increase the strength, and in this way to hasten the process of absorption. The bowels should be kept open, the bladder emptied by means of a catheter if there be retention of urine. Pain should be alleviated by opiates.

Occasionally profuse flooding has taken place at puberty, the menses making their first appearance as an abundant hæmorrhage. These cases are not very uncommon, but it is rare for such bleeding to be so profuse as to prove fatal, yet in some instances that has happened.

During the change of life, on the other hand, floodings are exceedingly common; and the time called the "dodging-time" is to most women a time of anxiety. The complete cessation of the menstrual function sometimes takes place quite suddenly. The woman is regular every month; the amount of the flow and its character are normal. It appears at the usual time, but never afterwards. The function has ceased. In other cases, again, the flow appears regularly from month to month, but in decreasing quantity, until it disappears entirely. In a third class of cases the flow becomes irregular; it is absent for two or three months, and then reappears again, then disappears for some time, then returns as a profuse flooding. It may go on in this manner for months, or even years, the flooding lasting at times for weeks, and proving a source of grave danger.

A number of other symptoms make their appearance about this time — symptoms of nervous derangement and of disorders of the stomach and intestines. Headache, pains here and there over the body of a neuralgic character, depression of spirits, a gloomy state, irritability, loss of memory, forgetfulness, and waywardness, are now and then seen at this period of life.

One of the most peculiar occurrences of this period is the conviction of the existence of pregnancy acquired by women, when no such state is present. This has been called spurious pregnancy. It is seen not at this period of life alone, but at any other time after twenty or twenty-five. Women who have had several children are sometimes mistaken in this way, and it is not easy to convince them of their error. It is due to the nervous state present, and to disorders of the stomach and bowels. Constipation is frequently present, and when already acquired becomes aggravated. There is a tendency in many to become fat and stout. Flatulence and flooding are very common causes of complaint at this time. This period of life has always been regarded as in some sense critical, and rightly so. Certain diseases take a favourable, others an unfavourable, turn at this epoch. Some diseases disappear, while others start into existence. If a woman passes through this stage of life in a favourable manner, she has good reason to expect fair health afterwards; she may be said to take a new lease of life.

TREATMENT.—The treatment of the troubles of this period are careful dietetic and hygienic measures. The diet should be plain and

simple—meat once a day : fish, meat, game, poultry, with bread, vegetables, and fruit. Beer and spirits should be avoided, and wine taken very sparingly. The bowels should be regulated. A blue pill occasionally, with a saline draught on the following morning, is of service, for the liver acts sluggishly. Indeed, all the secreting organs are somewhat inactive in the performance of their functions. Friedrichshall, Pullna waters, Carlsbad and Vichy salts are very useful, and in some cases should be regularly used. In some robust and plethoric women a few leeches, or occasional cupping, or even a general bleeding, may occasionally be called for. For the nervous symptoms sedatives are recommended, especially the bromide of potassium.

CHAPTER IV.

DISORDERS OF MENSTRUATION (*continued*).

Painful Menstruation, or Dysmenorrhœa—Neuralgia of the Womb—Congestion and Inflammation—Displacements of the Womb—Flexions—Membranes expelled during Menstruation—Pain in the Groin.

IN some women menstruation is a painless process. The flow comes unawares to them. This is probably the natural and healthy performance of the function. The greater number of women, however, suffer more or less discomfort—backache, headache, lassitude, and languor. In other cases, again, and they are by no means uncommon, the pain accompanying the performance of the menstrual function is severe. It varies in severity in different subjects; indeed, no two suffer exactly alike; the pain may be tolerable, or it may amount to the most excruciating agony. The pain comes on with the appearance of the discharge, and continues throughout the duration of the flow; or it may set in a few hours or a day before the discharge, and then it reaches its greatest intensity about the time the discharge reaches the outlet, continuing for the first day or two, and then subsiding. The causes of this pain often elude our investigation. It is present when the flow is scanty, as well as in cases where it is abundant; when nothing unnatural is discoverable in the womb, as well as when that organ is obviously diseased. There is no doubt that the cause varies in different cases. In some it is believed to be neuralgia of the womb; in others, congestion and inflammation; in others, obstruction to the flow and displacement of the womb; in other cases it is due to the formation and expulsion of the membrane; while, lastly, it may be due to disease in the neighbouring organs.

The pain is usually of a bearing-down character; it begins or centres in the bottom of the stomach, and spreads to the groins, loins, back, sacrum, and down the thighs. It is sometimes compared to the pains of labour. It is often complicated by urinary troubles, as frequent and difficult micturition, and forcing in the bladder, and with bearing down in the bowel.

Neuralgia is an affection of the nerves, and comes and goes by fits or paroxysms. Many parts of the body are subject to it, as the face, the loins, the left side, the back, the thighs, as well as the womb. It is

sometimes a most agonising pain, lasting for a considerable time; at other times it is a piercing, darting, or lancinating feeling. When the womb is subject to it, it manifests itself only about the menstrual periods. The pain is not limited to the womb; the skin of the lower part of the belly and upper part of the thighs is tender, sometimes exquisitely so. The menstrual flow appears scanty at first, then more freely, and then relief is usually experienced; more commonly, however, the flow comes only scantily, and in gushes, then it stops altogether for a time, or is reduced to a mere stain; there is again a return of the pain, and another gush of blood follows. In this manner it goes on for a part or for the whole of its duration. After the flow has ceased the patient recovers, to go through similar suffering with the return of the period. When this has gone on for some time, for years, the general system becomes affected. The patient becomes nervous and hysterical, suffers from flatulence, sickness, and obstinate constipation; has pains here and there over the body, headache, feels chilly, and is generally depressed, both in mind and body.

It runs a protracted course, lasts for years. It is generally difficult to cure. Before the appearance of the flow, when the pain first sets in, a hot hip-bath should be used. The water should be as hot as the patient can bear, and she should sit in it for half an hour or an hour. Narcotics are given to relieve the pain, should it continue. They should be used as pessaries.

During the intervals the general health should be attended to. Bark and acids, cod-liver oil and iron, are often beneficial. Quinine in some cases does good. Constipation should be warded off by gentle purgatives, of which the mineral waters are the best. Fresh air, exercise, walking, riding or driving, and early hours are valuable and necessary for recovery. Pregnancy will often, but not always, cure this disease.

The affection is sometimes seen in people of a gouty or rheumatic tendency. In such cases treatment should be directed to alleviate these conditions. Spasms of the wall of the womb are said to be associated with neuralgia. It is supposed that the narrow portion of the womb between the neck and the body becomes spasmodically contracted, and that at the time of contraction it retains the menstrual blood in the cavity of the womb, and when it becomes relaxed again the flow reappears in a gush. The treatment of this form is similar to that of neuralgia.

Congestion and inflammation of the womb are, as has already been described in treating of flooding, of frequent occurrence. They are often associated with inflammation of some of the tissues of the pelvis. The pain comes on several days before the appearance of the menstrual flow. The flow is at first scanty; after a day or two it becomes more

abundant, but the pain continues more or less throughout. The discharge often contains small coagula of blood and shreds of membrane, or "bits of flesh," as they are often called by patients. There is pain in the back, bearing down, aching of groins and thighs, a tired feeling, lassitude, and often sickness. The womb is often tender on pressure. the breasts swell and become tender and painful, there is irritability of the bladder and bowels, and generally a yellow discharge—the whites.

Hot hip-baths are useful, leeches to the fundament or the womb; during the interval, injections of hot water; plain living, moderate walking exercise, regulation of the bowels, and rest.

Obstruction to the free escape of the menstrual discharge is another cause of painful menstruation; and it is, perhaps, the most common of all. Moreover, it is not only the most frequent, but it is also the most easily relieved. The obstruction may arise from a number of causes, such as constriction of some part or the whole of the canal of the uterus, displacement, or displacement and bending or flexion of the uterus, tumours of various kinds.

Painful menstruation arising from narrowing of the canal of the womb is said to be not uncommon. This condition may be the original condition of the womb, a congenital one, or it may be acquired through the effects of inflammation after labour, or any injury. The pain due to it is severe. The discharge is scanty, escapes in gushes usually, each gush being accompanied by severe bearing-down pain, and followed by relief. There is backache, constipation, nausea, and vomiting; there is flatulence, and often tenderness over the lower part of the abdomen and groins. It is only possible to recognise the condition after a careful examination of the womb itself. It is not possible to make sure of it from the symptoms alone.

The object of treatment in such cases is to enlarge the canal of the womb, so as to make it sufficiently capacious to permit the easy escape of the menstrual blood. This has been effected by various means. Instruments called bougies have been passed along the canal of the womb through the narrow part. These should be sufficiently large to stretch it; sea-tangle and sponge-tents are used for the same purpose; or the opening may be enlarged by incision. These three methods are useful and suitable in different cases. The last is more permanent in its effects than the other two. Medicines have no effect on the condition in question, but still medication is often useful, because for a time the monthly sufferings of the woman give rise to constitutional disturbance, and bring on a train of symptoms similar to those described in the preceding paragraphs.

Displacements of the Womb frequently give rise to painful and also to profuse menstruation. In this place we will describe, as well as the

true displacements of the womb, certain conditions which simulate them, and which are constantly mistaken by women for them.

The womb is liable to be displaced in various directions. Upwards, by tumours pulling or pushing it; there are no symptoms connected with this form except those arising from its cause. To either side, from presence of tumours, or the contraction of inflammatory products; these, again, have no peculiar symptoms or treatment of their own. One of the most common forms of displacement is downwards. It is called falling of the womb. But women frequently say they have falling of the womb, that the womb comes outside, when such is not really the case. They find a smooth body bulging out through the mouth of the vagina, and they conclude it to be the fallen womb. There are other parts, however, which may fall down and bulge out in this manner, and these frequently complicate true falling of the uterus. The wall of the passage or vagina may be turned out, and form a considerable tumour. The anterior wall alone may fall, or the posterior alone, or both together. When the anterior wall is the part thus affected, the condition is called cystocele; when the posterior with the intestinal wall, it is called rectocele. These two conditions we will first describe, as they are so frequently mistaken by women for falling of the womb itself.

The walls of the vagina are attached—the anterior to the bladder, and the posterior to the bowel—by very firm and close-uniting tissue. For this reason it is not easy for the wall of the vagina alone to become the subject of prolapsus or falling; yet occasionally this happens. The far more common condition, however, is for the wall of the bladder or of the bowel, or both, to participate in the fall of the vagina.

Whatever increases the capacity of the vaginal canal, or the dimensions of its walls, or the size of its opening, or renders their tissues loose and soft, may give rise to the conditions now spoken of. Of course, pregnancy and labour are by far the most common causes of such a condition. Pregnancy induces laxity, softness, and enlargement of the vaginal wall, and of all the tissues in its neighbourhood. Labour—the passage of the child—gives rise to immense distension of the canal, and frequently to tearing or laceration of the band of muscles around its orifice, this band forming the chief support of the vagina, the anterior portion of the perinæum.

The displacement may come on suddenly, or by violent efforts, by falls, straining, lifting, and by anything which calls forth violent muscular action. More usually, however, this affection comes on gradually. The person has had several children. She has not completely recovered after her late confinements. She has had a sense of weight in the parts, a bearing down, occasional trouble with the water,

perhaps some difficulty in walking or standing long, but it has not been such as to attract particular notice. The womb has remained larger and heavier than it should be after labour, and the vagina more capacious or more relaxed; perhaps the perinæum has been slightly torn also. Another pregnancy and another confinement take place, and the consequence is that the fall of the vagina becomes marked. A portion of it is seen and felt in the shape of a round, smooth, soft swelling projecting through the vaginal orifice, and causes no little inconvenience.

Whites, or leucorrhœa, favour the production of this form of displacement. These discharges are rarely present for a long period without causing considerable relaxation of the vaginal wall and the parts around, and thus gradually pave the way for the falling of the part.

This condition is seen also in old people. In them the fat and padding around the vagina have been absorbed, the muscles are relaxed, the tissues are withered and wasted, they are unable to support the weight of the abdominal viscera, they yield, and the vaginal wall bulges out.

The symptoms of this affection are sometimes slight, sometimes severe in character. When the vaginal wall alone falls, there is a sense of weight and bearing down, a feeling as if something was coming away. There is a feeling of discomfort, and a difficulty in walking or standing. When the anterior wall of the vagina and the bladder are prolapsed, then there is in addition difficulty in micturition, the patient sometimes quite fails in her efforts to pass urine: she lies down, pushes the projecting swelling up, and then perhaps she can relieve herself. But even this expedient may fail; then the doctor is called, and the urine has to be drawn by an instrument. When there is difficult micturition the patient rarely empties her bladder entirely at any time. There is a little pouch of the bladder in the descended swelling which always retains a small quantity of urine; this decomposes, becomes offensive, sets up inflammation of the bladder; the patient now complains of pain, heat, forcing in the bladder, and scalding during micturition. By habitual care to empty the bladder completely, however, the condition last described may be avoided.

Instead of or as well as the bladder, the rectum or lower bowel may be dragged down by the vagina. When this happens the bowel is affected as well as the bladder. A pouch is formed just within the opening of the rectum, which bulges out beyond the surface. This pouch is liable to become filled with fecal matter. The bowels cannot be completely emptied. Irritation of the part is set up; inflammation in the lining of the membrane of the gut follows, diarrhœa may set in

of a mucous character, or obstinate constipation and great dilatation of the rectum may result; bleeding piles and ulceration are not unfrequent consequences. These changes in the bowel cause the patient the most varied troubles; the pain from the piles and ulceration is frequently excruciating; hæmorrhage takes place from the bowel, and there is a constant desire to go to stool and a severe bearing down.

These diseases can be easily recognised when care is taken in the examination. They should never be mistaken for anything else. When there is a falling of the anterior wall of the vagina, an instrument should be introduced into the bladder, and this cannot fail to show whether the latter organ is prolapsed or not.

When the posterior wall of the vagina is prolapsed, the finger should be introduced into the bowel, and search be made for the pouch characteristic of prolapse of the rectum. If this be found—as it cannot fail to be if present—the diagnosis is certain.

TREATMENT.—The treatment of these conditions is of great importance. Every effort should be made to cure, and not simply relieve the condition. To effect a cure a complete change in the condition of the parts must be brought about. This may in many cases be effected by rest, and applications in the form of injections or medicated pessaries. The applications used for this purpose are those which have a contracting or astringent action on the walls of the blood-vessels. They may be used in solution, and then are injected into the passage; or they may be used in the solid form, and in that case they are mixed with a substance which dissolves readily when exposed to a temperature of 99°, or blood heat. The substance most commonly used is cacao butter; others have been recommended and used, such as jellies; but none are so efficient as the cacao butter. The astringents used as injections are alum, lead, oak-bark, sulphate of zinc, tannic or gallic acid. All these are efficient in their turn. Any one of these should not be used for a prolonged time, because the parts appear to become accustomed to its action. It is advisable, therefore, to vary the preparations and drugs used when their use for a long period is necessary. These means, however, frequently fail, and others become necessary. Of these means instruments called pessaries are most generally in use. They are made of a variety of materials, and should be of the size and shape to suit the individual case. They should not be worn for any time without being frequently seen to. It is true that women often wear them for months, and even years, without suffering any great injury, but in many cases the injuries arising from such careless and reprehensible conduct is very great. A person wearing a pessary ought to have it seen to frequently at first, and when it is found to be suitable, it

should be examined every three or four months at least. These instruments, however, never effect a cure. Once a pessary is used for this affection, it will have to be used for life. In some cases, also, it is not possible to construct an instrument which attains the object of retaining the part in position. Such cases can only be treated by operation. Operative measures must be so devised as to meet the peculiarity of the case.

There is one other means which often gives great relief in these cases. It is the T bandage. The method of applying this useful support has already been described. It gives so much support to the perinæum, that it retains the parts from bulging out. The pad should be thick and well formed, so as to support the part uniformly and sit easily. Much may be done in this manner to relieve these troubles or affections without having recourse to an operation for their radical cure.

Prolapsus of the Uterus, or falling of the womb, is a disease frequently met with. It is usually seen in those who have borne children, but has been discovered in those who have not. It may come on gradually, or all at once. A very severe strain, or a sudden fall, or a fit of convulsions may be the cause of the affection coming on suddenly. In the great majority of cases, however, the cause acts slowly. The woman is a mother. She has had several children, perhaps. The tissues supporting the womb have been relaxed and stretched at each birth for the passage of the child. After labour the patient has not the amount of rest necessary for the parts to return to their usual state. She has been obliged to get up too early, had to return to the household duties. The result is a permanently relaxed state of the tissues supporting the womb. This is only one instance of the manner in which this condition of the parts may be brought about. There are other numerous cases, as want of food, over-nursing, a feeble constitution, etc.

Again, the perinæum may be torn during labour, as the head is born. The part is one of the chief supports of the vagina and womb, and any considerable laceration of it almost inevitably leads to falling of the womb.

Enlargement of the womb, provided it be not too large to descend through the pelvis, is another fertile cause of descent of the organ. This enlargement may be due to subinvolution, or a failure on the part of the womb to return to its normal state after labour, to inflammation and tumours of the womb.

Tumours in the neighbourhood may press it downwards, and the vagina may drag it downwards, but by far the most common are the conditions superinduced after labour.

It is met with also in old women, and in these cases the manner

of its production is peculiar. In such cases the womb is usually small, it is atrophied, its weight is small, for the organ is not much bigger than that of a child. In such people the fat which lies under the skin is absorbed, it disappears, and the skin becomes too large, loose, wrinkled. In a similar manner the fat around the internal organs is removed. The fatty pad found in the pelvis, around the vagina, bladder, appendages of the uterus, and the rectum, is removed. In this way the cavity of the pelvis appears larger, and, as far as the uterus is concerned, is actually larger, and as a consequence the womb descends.

The descent varies in degree. It may fall slightly only in the pelvis, or it may come down as far as the orifice of the vagina, and often it is found entirely outside, hanging down between the thighs.

The symptoms of this affection are by no means enough to characterise the disease, and examination alone is sufficient for the diagnosis. Women subject to prolapsus generally complain of pain in the back. This pain is at the bottom of the back. It is a continuous dull aching. This is a very common symptom of uterine disorder. The whites is not a rare accompaniment of this form of displacement. The vessels leading to the womb, and the tissues around it, are constricted in consequence of the displacement, and the organ becomes congested and enlarged. Menstruation may be natural, but it is occasionally very profuse and painful.

The actions of the bowel and bladder are interfered with. There may be difficulty at stool or in micturition, and very frequently there is great forcing both in the bowel and in the urinary bladder.

Inability or difficulty in walking is another symptom in these cases. The patient may be quite unable to walk, or she can walk for short distances, but with pain and fatigue. Excessive fatigue after little exercise—fatigue in utter disproportion to the exertion made—is frequently complained of by those suffering from uterine troubles.

When the womb has been outside for some time the soft red mucous membrane covering the vagina becomes altered. The constant exposure, and the irritation to which it is subject, change its appearance and character. It becomes pale, harder, and more like the skin of the body. Ulcers also form on parts of it. These are sometimes deep and sharply defined. They are found in the situations most exposed to rubbing and other irritation. The neck of the womb itself is frequently the seat of one of these ulcers.

TREATMENT.—The womb should be replaced, and maintained in position. As a rule, there is no great difficulty in replacing the organ; but sometimes the difficulty in effecting this is extreme, and requires the greatest skill in manipulation. In replacing the womb the patient

should be lying down on the side, or, better still, on the knees, with the shoulders low down, and then the protruding womb seized and gradually pressed upwards into its normal situation. In some instances it has been necessary to put the patient under chloroform, or some other anæsthetic, in order to attain this object. By this means all resistance, straining, and movement on her part are removed, and the muscles of the abdomen and chest are rendered lax, so that the object can be more easily gained. When the uterus has been replaced, the next object is to keep and maintain it there—to prevent its falling down again. This may be done in various ways.

In this connection a question of considerable importance arises, and that is the female dress. The clothes which women wear are supported by being tied round the waist. In some cases they are very tightly drawn around that part; but, fortunately, the absurd and wicked fashion of tight lacing no longer exists as in former days. But still, much mischief is done even now by tying the clothes round the waist in the manner usually adopted. The effect of this bad fashion is to increase the weight upon the lower wall of the belly. The intestines are pressed downwards upon the womb, and the perinæum and vagina have to do extra work. When this has been going on for years, and in favourable conditions, falling of the womb is necessarily brought about. The first thing to do, then, is to have the clothes properly made, and instead of being tied round the waist, they should be suspended from the shoulders.

If the patient can rest upon the couch, without walking or making any effort, and if the disease is recent, a cure can often be effected by appropriate treatment; but if the disease is of old standing, and the patient cannot lay up, the means of treatment are palliative only.

There is another disease of the womb which simulates in many points descent of that organ—that is, elongation and enlargement of its lower portion, which is called the neck or cervix. Cases of this are by no means uncommon. It occurs at all ages, in the married and single, in those who have had children and those who are barren. It is, however, oftener met with in married women. Women generally believe it is a true falling of the womb, and it requires a careful examination in order to recognise the true nature of the affection. The length of the elongated part may be such as to project at the orifice of the vagina, or it may only fill that passage like a polypus, or a foreign body. It is hard, smooth, and conical, with a hole at the most prominent part. The womb is longer and larger than usual. The woman complains of weight, bearing down, and discomfort in the bottom of the stomach. She is unable to sit without pain, the enlarged part being pressed upon. Whites are usually present. Menstruation is profuse, and often painful.

In some cases removal is the only effectual remedy. The operation is simple, and devoid of danger. When this has been done, the enlarged upper part of the uterus generally diminishes in size. In other cases, removal of the whole of the elongated part is not possible; but a portion of it may be removed, and this is often sufficient to effect a cure. Before this is attempted, however, rest, with general and local treatment, should be tried. The general health should be regulated, and the tonic applications described under falling of the womb should be used. These all afford relief, if not a complete cure. When these fail, operative means should be resorted to.

DISPLACEMENT, WITH CHANGE OF SHAPE, OR BENDING OF THE WOMB.—These are called flexions of the uterus. The organ is bent or doubled on itself. When the bend is forward, it is called ante flexion; when backward, retro flexion.

An inclination forward, with even a slight bend or curvature, is the normal position and shape of the womb in the virgin.

Flexion backwards, or retro flexion, is never a healthy and proper position of the womb. During early pregnancy the womb sinks in the pelvis, and is inclined slightly backward, but not bent in that direction. Later, as the womb grows larger, it loses that position, and becomes inclined forward, and maintains the latter position until the end of pregnancy. Slight ante flexion, as already stated, is a normal condition in the virgin; when it, however, becomes marked, it is disease. It is not unfrequently met with in a marked degree in the single as well as in the married. Retro flexion, or bending backward, on the other hand, is a rare affection in young girls, but more common in those who have borne children.

The symptoms vary somewhat, according as the womb is bent forwards or backwards; but they are not sufficiently distinct to distinguish one from the other. A careful examination of the womb itself can alone supply evidence sufficient for that. Usually there is severe pain in the bottom of the back, bearing down in the pelvis, pain in the groins and down the thighs, dragging at the navel, pain at stool, painful micturition, or micturition may be difficult or quite impossible, and painful menstruation. The menstrual discharge is often profuse, sometimes amounting to a flooding. The discharge is clotty, and often comes away in gushes. The pains accompanying this function are sometimes like those of labour. When conception takes place, abortion is likely to follow about the third or fourth month. Conception, however, rarely takes place, and the majority of women suffering with this form of displacement are sterile. There is usually a white or yellow discharge between the menstrual epochs. The general health becomes

affected, as it does, sooner or later, in most persons affected with disease of the womb. The appetite is lost, the digestion enfeebled, the blood becomes watery, nutrition imperfect, nervous symptoms now set in, and the patient ultimately may become hysterical. The pain in the back and pelvis becomes aggravated in walking or standing, and the patient is unable to walk. She consequently lounges about, and becomes a confirmed invalid. The causes of these forms of displacement are bad general health, want of tone in all the tissues of the body, congestion and inflammation of the womb, enlargement of the womb, pregnancy, labour, and abortion. Abortion is a very frequent cause, for the reason that it is too commonly regarded by women as an occurrence of but slight importance, and during the whole time they go about doing their household or other duties; or, if they are compelled to rest for some time, they get up before the womb has had time to return to its normal healthy state. Pregnancy in the poor is equally productive of the affection under consideration, for they are obliged to get up much before the time of complete involution of the uterus. Tumours of any kind pressing on or dragging the womb, as fibroid tumours, or osseous tumours, etc., give rise to flexions by their mechanical effects. Violent efforts, as in lifting, over-reaching, straining, vomiting, falls on the buttocks or pelvis, and tight clothing, may also bring on flexion. Many cases of flexion, however, are congenital; the womb was born in a bent state.

TREATMENT.—The object is to reduce the displacement and straighten the womb, and maintain it afterwards in its normal position. In some recent cases, and cases in which the displacement has been suddenly brought about by violence of some kind, simply straightening the organ and placing it in the normal position suffices to effect a cure. Such cases are, however, exceedingly rare. Usually, when medical advice is sought, the patient has suffered for months, or perhaps years, and the womb has become accustomed to its abnormal position; and in some cases inflammation has been set up around it, and bound it down by false membranes in that situation. When this is the case, when the organ is straightened and replaced, it immediately falls back again to the old position. Such cases are very difficult of treatment, and require a long time for recovery. The first object should be to replace the womb in its natural position. This is done by the hand, if possible; should this be impossible, instruments have been devised for the purpose.

After the organ has been replaced, means should be adopted to retain it there. These are several:—

Rest. This, in many cases, is absolutely essential. The patient

should remain in bed, especially when there is inflammation around the displaced organ. If there be congestion or inflammation and great tenderness of the uterus, leeches and the treatment described under the head of inflammation may be called for.

While resting the woman should lie on her face if she suffer from retroflexion, and on her back if from antelexion. Lying on the face is, as one would fancy, a rather irksome position; but by a little management and arrangement of pillows it may easily be rendered quite tolerable.

All pressure should be removed from the abdomen. When the patient rests in bed, of course this will follow in the course of things. When, however, she is up and about, it is far less likely to be the case. Women's clothes consist of heavy skirts supported by the hips. In some cases tight stays are often worn, so tight as to produce evil effects, by contracting the lower part of the chest and upper part of the abdomen, thus giving rise to imperfect respiration and crowding of the intestines in the lower part of the body. This occasions pressure on the womb, tends to displace it, to maintain it in an abnormal position, and is unfavourable to its restoration to its normal situation. To avoid these, two things may be done: the clothes may be suspended from the shoulders, and an abdominal supporter should be worn. The clothes may, by a very simple arrangement, be slung from the shoulders, and in this manner the abdomen be freed from their weight.

An abdominal supporter should be worn with the view of taking the weight of the abdominal viscera from the uterus. It is especially useful to women when the abdominal walls are lax and yielding, as they so frequently are after repeated pregnancies. It should consist of a belt of webbing, with strong elastic let into it at the sides. The belt should fit tightly round the hips. To the part of it which goes over the lower part of the abdomen a broad pad, stiffened by means of cork or a thin sheet of steel, should be attached. The pad should be about four inches square, and should fit the lower part of the abdomen below the navel. These means—which have the result of the removing of the weight of the clothes from the abdomen, and the abdominal supporter—are found to give, in many cases, great relief. They are, however, not efficient to maintain the womb in its normal position. They simply relieve it from causes which act unfavourably upon it.

To maintain the organ in the restored shape, certain instruments called pessaries, to which we have before alluded, are necessary.

Pessaries, though great evils, are in many cases absolutely necessary; and when all other means have failed in bringing about a cure, recourse must be had to them. They are, however, not suitable in all cases, for they cannot be tolerated when inflammation is present; and until this

is removed or mitigated their use is forbidden. Instruments of this kind are of various shapes. Some are introduced into the cavity of the womb, and allowed to remain there. These are called stems, or stem-pessaries. Others, again, are not introduced into the womb, but into the vagina only, and are made to press on the anterior surface of the organ, so as to raise and push the bent part backwards if the case be one of ante flexion. Those for retro flexion are made to press on the posterior surface of the bent organ, so as to raise and push it forwards. Some of these are entirely introduced into the passage, and are retained there by their shape and the tonicity of the part; others, again, are introduced in part only, and part of them remain projecting outside. The part in the vagina is made to press on the womb in such a manner as to straighten it and maintain it in position, while the part outside is attached to strings, which are tied round the body so as to maintain the instrument in its proper place. When these instruments are worn they should be frequently attended to. Every two or three months, at most, they should be taken out and changed, or re-introduced. Unless this precaution be attended to, serious injuries may result from the too long-continued or too great pressure on one part, besides the tendency of foreign bodies, when introduced into any part of the body, to become foul and encrusted with a deposit.

Membranous Dysmenorrhœa, or menstruation accompanied by pain and the expulsion of a membrane, is not a very common affection. It is seen occasionally, and is supposed to be due to inflammation of the womb. The menstrual period returns, and is accompanied by a good deal of pain of a bearing-down character, and situated in the region of the womb—that is, in the lower part of the stomach; on the first, second, third, or fourth day a membrane is passed. It is usually called by women a piece of flesh, and has somewhat of that appearance. It is sometimes a complete sac, a mould of the womb itself. It is three-cornered, flattened, and flocculent on its surface. There is a little hole in every corner. The membrane may be passed, however, in several pieces, at different days of the flow, or even in small shreds. Some authorities assert that inflammation is the cause of this affection; while others doubt the presence of inflammation in some cases, but admit it in others. There is no doubt of the existence of congestion and enlargement of the womb in all cases. The pain comes on several days before the appearance of the flow. It is situated in the pelvis, the abdomen, the groins, and back. It is of a bearing-down character—somewhat like labour pains. There is forcing also in the bowel and the rectum. Strange pains in the abdomen and around the navel are sometimes felt. The pain gradually increases in severity until the membranes are expelled. After this event it abates, and even ceases

altogether. The flow is at first in some cases scanty, but it increases until the membrane is passed, and immediately after is often very profuse and clotty. It occasionally lasts a week or ten days. During the intermenstrual interval the patient may be comparatively well. The membrane is expelled, as a rule, with every menstrual flow. Occasionally, however, a period may pass without a membrane. The disease sometimes appears to get well of itself. The membranes are not passed for months together, and then are passed again with every period. There can be little doubt that some cases which have been described as membranous dysmenorrhœa were cases of abortion. It is, indeed, difficult to distinguish early abortion from membranous sacs of dysmenorrhœa. It occurs at any age between fifteen and forty-five or fifty. It is seen in the married and in the single, in those who have had children and those who have had none. The condition, once it has set in, usually, but not always, entails sterility. There are some cases recorded where women who suffered from this disease became pregnant, and had happy confinements. At the same time this is rare. The continuance of the disease leads to general suffering. The whole body sympathises with the womb, every organ in the body becomes disturbed and fails in the discharge of its functions, nervous symptoms set in, and may end in confirmed hysteria.

Membranous dysmenorrhœa is a most intractable disease. It is very difficult of cure, and when a cure has been effected it has been after long and patient treatment. Rest, physical and functional, is of the greatest importance.

The attack itself is to be treated by anodynes. Medicines which relieve pain, as opium, morphia, chloral, etc., are administered; during the interval an effort should be made to improve the general state, and to remove the local affection. The bowels have a great tendency to become obstinately constipated. It is with difficulty they can be regulated. The stomach is almost invariably disturbed—often there is vomiting, and the tongue is foul. Brisk purgatives are the best means of relieving the two conditions: Epsom salts, Carlsbad salts, Friedrichshall water, etc., together with attention to diet.

Tonics are often called for to improve the condition of the stomach and blood; bitters, as quinine, bark, and mineral acids.

OVARIAN DYSMENORRHŒA.—This is due to inflammation and other diseases of the ovary. It is not uncommon. It may exist without any trouble in the womb, but it is frequently associated with uterine disease. What relation exists between the condition of the uterus and of the ovary, when they are present together, is uncertain. The pain comes on between the periods, sometimes several days before the

appearance of the menstrual flow. When the flow appears, the pain, in some cases, disappears, while in others it lasts while the discharge is on. The pain is situated above the groin, and extends up the side and to the back. It is usually on the left side, rarely on the right. The pain is occasionally severe, and there is also great tenderness of the skin over that region, so that the patient cannot bear the slightest touch, not even the bed-clothes. Women sometimes imagine that a tumour forms at the seat of pain, for they observe that the part is occasionally swollen. This swelling can in many cases be easily recognised. It is worse when the pain is severest; that is, before and about the menstrual epochs. It is not due to a tumour, but to distension of the intestine with gas—to flatulence. It disappears and reappears again at the next flow. When the bowels are confined the pain at stool is intense, sometimes so severe that the person faints. The pain is in the left side. There is often intense pain in the back and down the thigh on the affected side. It is aggravated by walking, driving, or riding, so that the patient in many cases is quite unable to take exercise, except that of the gentlest kind, as in a Bath-chair. It is very frequently accompanied by nervous symptoms. Vomiting is very common; hysteria by no means unusual. At first the nervous attacks appear only during or about the menstrual epoch, when the pain becomes aggravated, but after a time more or less prolonged they come on at any time. Any effort, mental or physical fatigue, or slight emotion, will in many advanced cases of the affection bring on a fit of hysteria. Exposure to cold during menstruation, and a rheumatic tendency, are said to give rise to it. A more frequent cause is pregnancy and labour. The treatment of such cases is attended with the greatest difficulty and anxiety. The general treatment is of the utmost importance, with a view to guard against the worst and most trying part of the affection, the nervous attacks. Women who are the subjects of this disease are generally weakly and delicate, and no treatment can succeed which does not improve the general health. Warm clothing is necessary. Flannel should be worn next the skin—vest and drawers. The diet should be good, simple, nourishing. Fresh meat and milk should be insisted upon; stimulants entirely interdicted. Exercise in the open air is absolutely necessary, in order to keep up the general health. When a patient is able to walk, it is better for her to do so than go in a Bath-chair or a carriage; but in cases where walking is impossible, she should be taken out every day in a Bath-chair. Riding and driving cause jolting, and this gives rise to aggravation of the pain and of the diseased condition. Warm hip-baths are useful. They should be taken once or twice a week. Blisters to the painful part relieve the pain. They should be frequently repeated, and healed as

quickly as possible. Other counter-irritants, as croton oil liniment and iodine, are used in some cases. Anodyne applications, such as belladonna plaster, chloroform liniment, etc., are frequently useful for the relief of the sufferings. Internally, tonics—barks, quinine, iodide of potassium and bromide of potassium, steel—acids, etc., are used. The bowels should never be allowed to become constipated, they should be regulated by saline or mineral aperients, for the certain consequence of constipation is great aggravation of the suffering.

CHAPTER V.

THE WHITES—OFFENSIVE DISCHARGES—HOW TO USE INJECTIONS.

IN health the only discharge which takes place from the generative passages is the monthly discharge of blood, called the menses. Many women have a whitish discharge for a few hours before the appearance of the flow and immediately after its cessation, but this must be regarded as part of the menses; while any discharge occurring at any other period is undoubtedly the product of disease either general or local. Discharges are of very frequent occurrence. Indeed, few women pass through life without at one time or another suffering more or less from discharges. They have received the name of "whites." They are, however, of very different characters, have different properties, and originate from different sources.

Slight causes suffice in many cases to give rise to a discharge, as a chill, exposure to a draught of air, or change in the constitution of the atmosphere. The great majority of the diseases which affect the sexual system give rise to a discharge; and such discharge may be poured out by the vagina, by the womb itself, or by parts situated in the pelvis outside the womb.

A pale white discharge is occasionally seen in young girls who are not regular, or in whom the menstrual discharge has not appeared at all. In these cases it returns monthly, at the times in fact when the menstrual flux should appear. It is in fact a sort of substitute for menstruation, a sort of "vicarious menstruation." In some cases the discharge is free and abundant, and consists of whitish or yellowish mucus; it lasts for two, three, or four days, then ceases, to return again at the end of the monthly interval.

Disorders or irregularities of the menstrual functions, painful performance of it, increase in the amount of the flow, are frequently associated with a yellow discharge, which flows continuously or at intervals.

Constitutional states may be the cause of whites. In scrofulous persons the mucous membranes have a tendency to become soft and somewhat swollen. The surface of the membrane not unfrequently becomes a little uneven—granular. This is very often seen in the mucous membrane covering the eye-ball. In such persons leucorrhœa

is a by no means uncommon affection. It is also seen in the gouty, the rheumatic, and the consumptive. These forms of the disease are of a very obstinate and rebellious character. Inflammation of the genital passages, or any portion of them, is a not uncommon cause of this affection. In this manner inflammation of the vagina or of the womb may be the disease which must be cured in order to remove the accompanying discharge.

It is a matter of some importance to make out the exact source of the discharge, whether it comes from the vagina, from the neck of the womb, or from the body of the womb. It may have its source in any one of the situations named, or in all of them; the treatment, of course, will vary in some very important particulars, according to the part of the canal diseased; the treatment applicable to vaginal leucorrhœa is not applicable to that of the uterine cavity, and *vice versâ*.

Debility, anæmia, or deficiency and poverty of blood, is a very frequent cause of whites. In this condition of the blood the whole body is affected. The blood being the source of the nutriment carried to the tissues, its constitution necessarily has a direct relation to the constitution of the tissues; and when the blood is deficient and the blood corpuscles few in number, the tissues will be insufficiently nourished, and in a state of relaxation. There is a tendency in these conditions to an excessive secretion from many of the glands of the body. The skin is frequently moist from the excessive action of the sweat glands. The mucous membranes are liable to pour out fluxes, and the genital canal pours out white discharge.

Disorders of the stomach and bowels are sometimes accompanied by leucorrhœal discharge. Indigestion, constipation, diarrhœa, or excessive distension of the abdomen, give rise to it without there being present any evident disease of the uterus.

In many cases it arises from want of cleanliness, and improvement in this respect will be immediately followed by a diminution in the quantity of the white discharge. Leucorrhœa, as we shall state when treating of pruritus, or itching of the vulva, is a frequent cause of that distressing malady. It may also give rise to inflammation of the external organs of generation, of the upper parts of the thighs, of the vagina, and to sterility or barrenness. It may also in some cases be the cause of enlargement of the womb.

TREATMENT.—One of the first things that should be done is to observe the most absolute cleanliness. External washings and ablutions are not sufficient. The vagina or passage should be carefully washed out with warm water once or twice a day. It is convenient to do this while in the morning bath, and while retiring at night.

This is a most important part in the treatment of the affection. The further treatment must depend upon the exact nature of the case. Should the source of the leucorrhœa be the vagina, astringent injections will be useful. Should it depend on disease of the uterus, special local as well as general treatment will, in most cases, be required. When it arises from constitutional states, these should be treated. If there be a rheumatic tendency, warm clothing, efficient action of skin, etc., will be advisable. If gouty, stimulants should be avoided, exercise taken, and saline purgatives occasionally. If the discharge depends on anæmia, the treatment of that affection should be adopted. There are few cases where the object should be simply the suppression of the discharge; indeed, as a general rule they should endeavour to remove the cause of it rather than simply suppress it.

Some women are rather fond of using injections of cold water and of astringent solutions. The practice in many cases is harmless enough; but every now and then they are used with very disastrous effects, for they set up inflammation in the abdomen around the uterus, cause intense pain, and render the person an invalid for months. Cold water, and astringent solutions of alum, tannin, oak-bark, lead, zinc, etc., should only be used when advised by a doctor, and when there is no congestion or inflammation of the parts. When the latter conditions are present astringents are injurious, and soothing fluids should be used, such as infusion of linseed or starch, or a weak decoction of poppy-heads. When the acute symptoms have been in this manner subdued and the case has become chronic, then the use of astringent injections is to be recommended. In many cases, however, it is found that the most skilled and varied treatment fails in its purpose of curing the disease and suppressing the discharge.

INFLAMMATION OF THE VAGINA—VAGINITIS.—Severe inflammation of the vagina is a very painful, though not a very common affection. It arises sometimes from the injuries done to the vagina by the head in its downward passage during labour; from exposure to cold during the menstrual discharge; from injuries inflicted on the coats of the passage by the introduction of foreign bodies or injections, and it also occurs during fever.

The symptoms are generally very severe. There is intense pain or burning in the part; micturition is painful and scalding, it may be difficult or frequent; there is a sense of bearing down and of weight in the pelvis; violent throbbing; profuse discharge of yellowish matter having an offensive odour; the parts around the opening of the passage become red, swollen, the skin over them stretched, and the inner surface of the canal is intensely red, hot, and covered with matter. It

is very tender, and not unfrequently slightly ulcerated. The vulva, or external parts, are excoriated.

In this form the disease lasts several days, or even two or three weeks; then the violent and pronounced symptoms just enumerated gradually decrease in severity, and the disease subsides into the form next to be described—chronic vaginitis. The inflammation occasionally extends into the cervix and body of the uterus, giving rise to a disease we shall describe later on, which is called endometritis, or an inflammation of the lining membrane of the uterus; it may even pass up into the fallopian tubes, and through them as far as to the cavity of the abdomen, thus giving rise to pelvic peritonitis.

TREATMENT.—The patient should rest quietly in bed, and should avoid walking and movement as far as possible. The pain should be relieved by bathing with a decoction of poppy-heads, or hot water; hip-baths of hot-water; injections of decoction of poppies, of starch, or of linseed tea, should be frequently made. After the injection, a pessary of opium or morphia should be introduced into the passage—especially if the pain be very severe. The bowels should be kept freely open by saline draughts, and the diet should be low and unstimulating, alcoholic drinks being entirely avoided. Abundance of diluent drinks, as barley water, linseed tea, and lemonade, should be taken, with a view to increase the quantity and dilute the strength of the urine. When the pain, swelling, and extreme redness have disappeared, and the disease has settled down to the chronic form, then astringent injections are of great use, as solutions of alum, acetate of lead, sulphate of zinc, etc. But these remedies, it must be remembered, should not be used in the first stage of the disease.

Chronic Inflammation of the Vagina is a very common affection, induced by very slight causes. It gives rise to a discharge of yellowish or whitish fluid, which is sometimes constant and profuse. This is not noticed, or, if noticed, not treated at first, and after a time it gives rise to discomfort and unpleasant general symptoms—headache, loss of appetite, depression of spirits, indigestion, nausea and sickness, lassitude, inability to walk a moderate distance, a sense of weariness or fatigue, and constipation. Along with the discharge little shreds of membrane are frequently shed, and sometimes even perfect moulds of the passage.

TREATMENT.—The general health must be attended to. Bitters, as bark or quinine, and acids. The bowels should be regulated; change of air is useful, sea-air and sea-bathing. Cold douches or cold baths; good and generous diet. The local treatment consists in the use of injections of warm water for cleanliness, and of acetate of lead, sulphate of zinc,

tannin, alum, or some other astringent solution for constricting the vessels of the part, and to give them tone. Though the disease is frequently obstinate and rebellious, yet by perseverance, and by improving the general state of the health, a cure may generally be effected. The method of using injections will be given later on.

OTHER KINDS OF DISCHARGE.—Children occasionally suffer from a white or yellow discharge from the generative passages. It is of great importance to attend to this, for it gives rise to irritation, and the child may scratch or rub the parts for relief, and in consequence possibly acquire bad habits. It is seen in scrofulous, weakly children. Thread-worms occasionally give rise to it, and to intolerable itching of the part. It occurs also in acute fevers, as small-pox, scarlet-fever, etc.

The first step in the treatment is cleanliness. The parts should be carefully washed with warm water two or three times a day. Having done this, they should be bathed with a little lukewarm Goulard water. and a strip of lint wet with the lotion should be placed between the parts. The child should be kept at rest. But this is not enough, the cause of the discharge should be removed. If the child is scrofulous or weakly, she should have cod-liver oil, steel wine, fresh air, and good food. A search should be made for thread-worms in the motions, and if there be any present, injections into the bowel of salt-and-water, or of lime water, should be administered two or three times a week until none can be any longer found. At the same time steel wine, or some other preparation of iron should be given.

When this form of leucorrhœa occurs in the course of an acute fever, the treatment of it should be deferred until the child is convalescent, when the means which have already been indicated should be had recourse to.

Besides discharges of mucus or of matter, a watery discharge occasionally flows from the vagina. This is profuse and abundant in some cases of pregnancy, and probably has its origin in the fluid surrounding the embryo. It passes out of the womb by oozing through, or by ruptures of the membranes enclosing the child. It occurs usually in advanced pregnancy, and may come away in gushes for a short time. It does not necessitate miscarriage or interruption of pregnancy, but should pains like those of labour supervene, miscarriage or abortion will probably follow.

Again, in certain forms of abnormal pregnancy a considerable amount of watery discharge from the vagina is seen, such as those cases of false conception called hydatid, vesicular, or grape mole.

In certain diseases of the uterus such discharges are very abundant, as in cauliflower excrescence or epithelial cancer of the neck of the

uterus. In such cases it is almost a clear watery fluid, or it may be slightly brownish. The amount discharged in this disease is sometimes very great.

Such discharges are also associated with cancer of the body of the womb, with polypus, and with fibroid tumours.

Occasionally an ovarian cyst discharges its contents into the womb or the vagina, and a profuse watery discharge follows.

After labour such discharges are also seen, and are due to imperfect involution, or to disease of the lining membrane of the uterus.

The bladder may open into the vagina by an artificial opening and the urine escape involuntarily by the vagina.

OFFENSIVE DISCHARGES.—The discharge from the vagina may have an offensive odour. In some cases it is exceedingly offensive—so much so that the patient is a burden to herself. There are several conditions which give rise to this peculiar condition. It has been thought that such discharges are met with in cancer only, but such is not the case. It is true that the discharge which flows from a cancerous ulcer and from cancerous growths of the uterus and vagina have frequently a very unpleasant odour, but cancer of these parts may exist not only without offensive discharge, but for a long time without any discharge at all.

The discharges caused by the presence of a polypus, however, may become offensive; indeed, any discharge from the vagina, whatever may be its cause, may become offensive if it be retained in the passages for any time. Such retention may be due to a small external opening, to constriction of the uterine canal by flexion or by fibroid tumours. Sometimes it will happen that the discharge is offensive without any discoverable cause.

Offensive discharges also occur during pregnancy, or after confinement. The embryo may die, and be retained in the womb in part or wholly for a considerable time, and may give rise to abundant discharge having an offensive smell. Or a miscarriage or abortion may have taken place, and a portion of the membranes and after-birth be retained, which, by undergoing decomposition, give rise to similar discharges. A portion of the after-birth may be retained after labour at full time, and cause similar symptoms.

These discharges give rise to much discomfort, sometimes on account of their quantity, sometimes from their offensive odour, sometimes from their irritating properties.

The quantity varies much. It may be so slight that a woman is scarcely conscious of its presence, and it may be so profuse that she has to employ two or three dozen napkins a day. When she stands

up, after having occupied the recumbent posture for some time, it may flow in a stream from her.

The unpleasant odour of some discharges we have already spoken of.

The irritating properties of other discharges is occasionally very great. There is constant itching of the external parts, they may become inflamed, excoriated with small ulcers upon them. The skin around, and even the upper parts of the thighs, may be affected in this manner.

Besides the treatment of the conditions which give rise to these discharges (which has already been given) there are one or two observations which should be made here which will greatly conduce to the comfort of the sufferer, and in many cases hasten recovery. Absolute cleanliness is most important. Frequent ablutions with warm water. Injections into the vagina of the same fluid two or three times a day; when the discharge is offensive, a little Condyl's fluid or a little carbolic acid (a drachm to a pint) may be added to remove the smell. In this way will not only the evil effects of the discharge be, to a great extent, prevented, but the offensive odour will also be more or less completely removed. As soon as the discharge is secreted it is washed away, and has no time to become offensive by being retained within the passage.

MODE OF USING INJECTIONS.—A proper instrument should be used for injecting fluid into the vagina. Glass syringes of various sizes are sold for this purpose, but they are quite useless and worse, for they are dangerous. It has happened that a glass instrument has broken in the passage while being used. The proper instrument is an india-rubber "tube and ball." It should have a long gum elastic tube, with the openings in its sides for introduction into the vagina. The vaginal tube should have no opening at its point or end. A good syringe is that which is called Higginson's syringe. The patient should lie on her back with a vessel conveniently placed, so as to receive the injection as it returns from the passage. A nurse should administer the injection. If water be employed for cleanliness or other purpose, two or three pints should be used. It should be injected slowly, and no force employed.

CHAPTER VI.

SUBSTANCES EXPELLED FROM THE WOMB—MOLES, ETC

SSOLID masses are not unfrequently passed by the vagina. They are of various kinds, and to be able to recognise their nature one must be acquainted with the anatomy of the uterus and vagina, and of the human embryo. Frequently the aid of a microscope is necessary to distinguish their nature.

By far the most common substance thus passed is coagulated blood. This is often described as a "piece of flesh," "membranes," "like pieces of liver," etc. Clots of blood may be passed in the form of recent or of old coagula. In the former case they are generally of a dark or brown colour like liver, softish and easily broken down; in the latter, they may be pale, fleshy-looking, decolourised, and of firm consistency. Recent clots may be of any shape, usually having somewhat the shape of that part of the vagina in which they have been lodged. Old clots are generally formed in the cavity of the womb, and have a pear-shape—the shape the womb assumes as it becomes distended. Substances of this kind may be expelled by married or single women, mothers or virgins.

MOLES.—These are the products of conception, and are of two kinds—the "fleshy" and the "hydatid," "vesicular," or "grape" mole.

The fleshy mole, as its name implies, appears like a fleshy mass, in which masses of coagulated blood are found. It is due to effusion of blood into the membranes of the embryo at an early period. Abortion does not take place, but the mass remains in the uterus, and remains in a more or less vital connection with it. It may be retained for several months, and then be expelled. The nature of the mass is known by the presence in it of traces of the membranes of the embryo.

The grape mole consists of a mass of small sacs about the size of small grapes, joined as it were like beads on a string. It is the product of conception, but the embryo dies at an early age, and the membranes develop into grape-like bodies. The woman usually believes herself pregnant, though she may think that all is not right. The abdomen grows very rapidly, much more rapidly than in healthy pregnancy. At the third month the abdomen may be as large as at the sixth month of pregnancy. There is a profuse discharge of watery

fluid, often stained with blood; occasional bleeding; sometimes some of the small bladders are passed, and then the nature of the affection is clear. There is often bearing down, and pains like labour pains. At last the womb acts and expels its contents. The size of the mole varies. It may be only the size of an egg, but it may attain an enormous size.

When the condition is made out, the uterus should be excited to expel its contents.

Portions of the after-birth may be retained after labour, become organised, and firmly attached to the womb, and ultimately be expelled. It may be regarded as a kind of mole or polypus. When expelled, its nature can be distinguished by the microscope, which would reveal the structure peculiar to the after-birth.

Membranes are sometimes passed from the vagina. These may be casts of the womb, as in membranous dysmenorrhœa, or they may be casts of the vagina itself. The latter are less frequently seen than the former. They are known by their shape, size, and structure. The former, when perfect, have a triangular, flattened shape, a shaggy surface, and with a hole at each corner; the latter have the shape of a flattened tube, having an opening at each end, the surface is shreddy, and marked with irregular elevated lines or ridges, characteristic of the vagina. The appearances presented under the microscope are distinctive. Of course, both these may be and are most frequently expelled in pieces, and not as perfect casts of the organs of which they are the mucous lining.

The treatment of the conditions which give rise to expulsion of membranous casts of the womb has been given under membranous dysmenorrhœa.

The cause of the shedding of casts of the vagina is as a rule the use of irritating injections, and when the employment of these is given up the trouble usually ceases.

CHAPTER VII.

PAIN IN THE EXTERNAL PARTS—INFLAMMATION AND ABSCESS—TUMOURS—
BLEEDING FROM EXTERNAL PARTS—ITCHING AND IRRITATION OF—
PAIN IN THE BACK, ABDOMEN, AND GROIN.

THE SIGNIFICANCE OF PAIN.—Pain in any part of the body is evidence of disease. It is presumptive evidence of disease of the part or organ in which the pain is felt; but careful inquiry often shows that though the pain is evidence of disease, it is often of disease of a distant organ; neuralgia of the brow is often due to disorder of the stomach, and pain in the ear to a diseased tooth. So the pains which owe their existence to disease of the generative organs may not be seated in the pelvis alone, but also in the thighs, the sides, back, etc. We have already discussed the pains which are so commonly suffered by women during the menstrual flow, and we shall make little or no reference to them in this chapter. Pain, however, is sometimes the only evidence of the presence of uterine disorder, and it is well to have some idea of the various pains which are called forth by diseases of the organs of generation.

PAIN IN THE EXTERNAL PARTS—IN THE VULVA.—The external parts possess a very high degree of sensibility. The membranes covering them—both the skin and the mucous membrane—are abundantly supplied with nerves, and these nerves are in great part nerves of sensation—capable of transmitting sensations of pleasure and pain. They are, moreover, supplied with an immense quantity of blood. In certain states especially they become turgid and full. This is due to distension of the blood-vessels in their substance. These blood-vessels consist not only of the ordinary arteries, veins, and capillaries found in other parts, but also of great networks of veins, technically called plexuses. These veins are of considerable size, and join with one another on all sides, so that the tissue of these parts has in reality a structure which could be compared in some respects to that of a sponge. It possesses, in fact, a network of canals freely communicating with one another similar to that found in the sponge, by the filling of which with water the sponge becomes enlarged and swollen. It is not to be wondered at then that these parts should be subject to diseases of a very painful

character. These diseases, or some of them, can be excited, or called into existence, by very slight causes. Very trifling irritation, an acrid discharge, or even any discharge from the passages, may call forth a painful inflammation or an intolerable and persistent irritation. Causes of so slight a character that they could not set up any disturbance or discomfort in many other parts of the body, when applied to these parts make themselves immediately known on account of the peculiar anatomical structure of the parts—their great vascular and nervous supply. These parts may be affected with any of the following diseases.

INFLAMMATION.—Inflammation is a disease accompanied as a rule by considerable pain. This is especially the case when it attacks certain parts. Inflammation of the eye is accompanied by very severe pain, so is inflammation of the joints. The inflammation which accompanies gout, or which arises from an attack of gout, causes the most exquisite and severe agony. On the other hand, inflammation of the lungs is not very painful—though it is accompanied by great depression. Inflammation of the part now under discussion—the vulva—is a very painful disease. There are several kinds of this affection, as there are several kinds of inflammation affecting other parts. When inflammation affects the surface of a part and structures beneath (for it rarely affects the superficial textures alone), and causes matter to be formed abundantly on the affected surface, it is called purulent. The term is taken from the word pus, the technical name applied to the discharge called matter—such as that which is discharged when an abscess is opened.

In many situations in the body, again, there are small glands in the shape of little vesicles or bladders buried in the tissue, but causing as a rule a slight projection on the surface. These are called follicles. They are found in many places, especially on mucous surfaces. They may be easily seen on the inside of the lips or cheeks, in the throat, on the tonsils, and they are found also on the mucous surface of the vulva.

In certain cases these parts become inflamed, and this form is called follicular inflammation.

There is another form of inflammation not so frequently met with in these parts as the purulent and follicular, which is called the gangrenous. It is seen attacking the face of children occasionally, and is then called *cancrum oris*, or *noma*.

Inflammation of the vulva is technically called *vulvitis*. The parts become red and painful. At the same time they begin to swell. Heat or a sensation of burning is felt in the parts, and they are hot to the hand. They soon become covered with purulent matter, but at first when the disease sets in they are dry. The pain is severe; in some cases there is intense itching of the part, and it is difficult for the

patient to restrain herself from rubbing or scratching them; but when this has been done it brings no relief, and, moreover, it increases the irritation. The matter discharged has usually, if not always, an offensive smell. It is of an acrid and irritating character, causing inflammation of the parts it comes in contact with. The greatest care should be taken that none of it be brought in contact with the eye, whether it be by means of the hands or towels used, because it would inevitably give rise to a form of ophthalmia of a most destructive character.

The vulvitis frequently extends to the neighbouring parts. It may extend up into the urethra, the passage leading from the bladder, along which the urine is passed. When this happens, micturition becomes painful. It is accompanied by heat and scalding. It becomes frequent, and often there is much straining. When it extends beyond the urethra into the bladder these symptoms become more severe. There is constant desire to urinate. The act is exceedingly painful. The urine is thick, and contains masses of a jelly-like character—the mucus of the bladder containing a deposit of urinary salts. The inflammation may also extend up into the vagina, and then we get vaginitis and its symptoms. These we have already described. The fever accompanying these affections varies according to the extent of surface involved and the acuteness of the attack. If the attack is slight, and affects a small portion of the vulva only, there may be little or no fever. Should the whole of the vulva, however, be affected, and the inflammation extend into the urethra, bladder, and vagina, there is great heat of skin, thirst, and general fever.

This affection should be treated actively from the first. It is of the utmost importance that the diet should be regulated, and that all the functions of the body be carefully supervised. The patient should rest entirely in bed. Walking or moving about irritates the parts and aggravates the inflammation. It causes the matterly discharge to come in contact with the thighs, and excites inflammation in these parts. The bowels should be acted upon freely by saline purgatives. Epsom salts is one of the best. The urine should be rendered as dilute and little irritating as possible by the administration of alkaline drinks and barley water. It is of great moment to render and keep it neutral in reaction. The diet should consist of slops. No spirits, or wine, or malt liquors should be taken. The inflamed parts should be frequently bathed in warm water, or a decoction of poppy-heads. This should be done every four or six hours, and during the intervals poultices of linseed-meal or hot fomentations should be applied. When the violence of the inflammation has passed away, the diet may be improved, purgation is no longer necessary, and the frequent bathing and poulticing should be given up. Then cleanliness, bathing the parts

with warm water, or Goulard water, two or three times a day, and an application of lint wet with a lotion of acetate of lead will, as a rule, effect a cure. Should this fail, more astringent applications may become necessary. In obstinate cases many remedies will have to be tried, probably, before the one suitable to the case is discovered.

Gangrenous inflammation is fortunately not of frequent occurrence. It is a terrible disease. It frequently ends in death. It is seen in children, and is due in the larger number of cases to blood-poisoning in some form or other, as fevers of all kinds.

The parts become swollen, purple, dark, and black. Mortification soon sets in, and the parts become extremely offensive. The disease extends, and the patient often succumbs.

The treatment should be active, in order to support the patient. The most nourishing food in the most digestible form—wine, brandy, ammonia, bark, and other stimulants should be freely given. The putrefying part should be absolutely destroyed by means of a caustic. It should be entirely destroyed, and in order to ensure the destruction of the whole of it a portion of healthy tissue should be included. The means generally used for this purpose are the actual cautery or the strong, fuming nitric acid—the aqua fortis. Warm poultices of linseed-meal, or poultices sprinkled over with charcoal, to destroy the smell, should be constantly applied.

PARTIAL INFLAMMATION AND ABSCESS OF THE VULVA.—Inflammatory action, having begun in the external parts, may become general, as above described, or may be limited to a greater or less portion of those parts. It affects not the surface only, but the deeper structures. The deeper parts may alone or chiefly be involved, the surface becoming red only in consequence of the mischief in the deeper structures. In this case the inflammation is said to be circumscribed. The first notice of anything wrong is given by a pain and a pricking sensation in the part, then swelling takes place, which soon becomes hard and very tender. The swelling is limited to one side, and is large enough to almost close the opening. There may be difficulty in micturition, arising from the same cause. After a time the hardness disappears, and the tumour becomes softer and softer. The hard substance has now become a fluid mass—matter is formed. As soon as matter is formed it should be allowed to run out from the body, and in all cases, when possible, a way should be made for it if necessary. People have usually a great horror of the lancet, not only on account of the exquisite pain which it causes, but also from a prejudice that it is a practice fraught with evil, and that it is better for the matter to find its own way to the surface, or be drawn there by poultices. It is true

that the pain arising from the use of the lancet—on account of the inflamed and sensitive condition of the part to be divided—is exquisite; but it must also be remembered that it is momentary only. The operation, if it deserves the name, takes but an instant, and the relief which follows is not only instantaneous but permanent. The moment that the distended sac which is filled with matter is opened the pain ceases, and the patient is in comparative comfort. The prejudice in favour of poultices, and the belief in their power of drawing matter to the surface, is without foundation. There is no basis for it, general as it appears to be. Poultices are useful in a very great number of cases where there is local pain, on account of their power of relieving pain. The warmth and moisture which they contain favours the circulation in the part, and this alone is their action, and it depends on their power of retaining for a long period moisture and heat. The best poultice is that which remains hot for the longest period without becoming dry. Poultices, then, or any other external applications, have no power to attract matter to the surface. This can only take place naturally, by the formation of more matter and the destruction of more tissue. This is always accompanied by a good deal of pain. It is also usually a very slow process. Moreover, when the matter has thus reached the surface, and the skin has given way and the abscess is discharged, the work of recovery is greater, slower, and more prolonged than if the abscess had been opened at an early period, as soon as matter was formed, and when it was small in quantity. Besides, recovery is not only more tedious after the natural discharge of abscesses, but it is also, as a rule, less perfect. The cavity of the abscess is liable not to close entirely, and a canal, or sinus, or fistula remains, which continues to discharge a thin, often irritating, unhealthy kind of matter. The difficulty of curing such a canal is often very great. Its walls are thick, hard, and grisly; they pour out an unhealthy discharge. It is difficult to get them together and to make them unite. Their vitality is low, and the difficulty often is to alter their character and bring about a cure. Such are not unfrequently the results of allowing an abscess to open naturally, which, had it been opened by the knife or the lancet as soon as matter had been formed, would have probably been well before the natural opening had been effected.

TUMOURS OF THE VULVA.—Cysts are not unfrequently met with in this situation. They vary in size considerably. They frequently cause no inconvenience, and remain unobserved. This, however, occurs when they are small only, for when they attain any size they form a swelling which draws the attention, for they partially occlude the orifice of the

passage. These cysts are not usually painful. They may, however, become inflamed, then the pain of them is severe, and abscess may form. When, however, inflammation is not present, they give rise to nothing but inconvenience on account of their size. They should be carefully distinguished from abscess, for the same method of treatment cannot be adopted in the two cases. The distinction is easy. The history is sufficient. The pain, heat, tenderness, and redness of the early stages of abscess are not met with at any time in the history of cysts; and, as a rule, cysts are discovered accidentally, whereas abscess commands the attention from the first.

The treatment of cysts must be operative. They may be dissected out, or opened. When opened, the substance in them is sometimes a thick, viscid, pale, transparent jelly; at other times, a substance of a similar consistence, stained with blood, or it may be a thin sanguineous fluid only.

Enlargement or hypertrophy of the parts themselves. Any one part of the external organs of generation may be the subject of enlargement. The part then looks as if it were swollen, but is not red nor tender, and it is free from pain. It may have its natural consistence, or it may be harder than usual. They may be seen in children—that is, children are born occasionally with such an affection. The treatment when necessary is operative. There are no other means which can be effective.

Warts are also sometimes seen on these parts. They cause a good deal of irritation and trouble. A discharge of a watery character flows from them, and they often bleed.

TREATMENT.—Removal by operation.

TUMOUR OF THE ORIFICE OR MEATUS OF THE URETHRA.—The orifice of the urinary passage is not uncommonly the seat of a growth which causes the patient the most refined torture. This tumour or growth is a red vascular swelling on the mucous membrane of the opening of the urethra. It is usually small—it may be as small as a hemp-seed, or as large as a cherry. It is usually attached closely to the tissues beneath, but occasionally it has a longish stalk, half an inch or more in length. It is of a dark red appearance, is rough or uneven on the surface, lobulated. It is soft to the touch, and very tender; it bleeds easily, and breaks down with great readiness.

The patient complains of the severest pain in passing urine. They describe this pain in the strongest language, and postpone the act until compelled to it by dire necessity. It is easily recognised when looked for. Touch alone will give rise to a strong suspicion of its presence, on

account of the excessive and unnatural tenderness in the situation of the urethral opening, but ocular examination puts the diagnosis beyond doubt. The tumour is seen, and its character recognised.

TREATMENT.—It is often troublesome to cure. The symptoms can be often greatly relieved by medicine. The pain can be relieved, and micturition rendered tolerable; but the worst troubles soon return again. The application of anodynes, as opium, aconite, hydrocyanic acid, chloroform, can only be palliative in their effects. For a cure to be effected, extirpation of the growth is necessary. This may be done by direct removal or by caustics. It depends a good deal on the form and position of the tumour which of those means is most suitable to the case. Even when apparently completely removed, the growth occasionally returns again. In such a case the operation for removal should be repeated.

BLEEDING INTO OR FROM THE VULVA—PUDENDAL HÆMORRHAGE.—This is by no means a common affection. The blood may flow into the tissues of the vulva, and there form a soft swelling—a sanguineous tumour; or it may flow till the surface of the skin be lacerated. It is more common in the married than in the single. The veins during pregnancy often become enlarged, hard, and swollen both in the lower limbs and in the private parts, from the pressure upon them preventing the easy and rapid flow of blood. In consequence of this, the veins give way and hæmorrhage follows. Muscular efforts, by causing a great strain upon some of the veins, produce a similar result. Blows on the part, produced by falling, riding, etc., may cause such laceration and bruising of all the tissues as to give rise to profuse bleeding. Wounds of the part, produced accidentally or otherwise, are another cause.

When the blood is poured into the tissues, and does not appear externally, and when it is produced by no external injury to the parts, there is pain, pricking, and perhaps throbbing, in the part, and a swelling forms usually very rapidly. The swelling sometimes becomes very large in a very short time, and may prevent micturition.

The *treatment* consists in the application of cold and pressure. Cold should be applied by means of evaporating lotions or a bladder of ice, pressure by means of a T bandage and a pad. A T bandage consists of a belt surrounding the abdomen just above the hips. It should be applied moderately tight, so that it cannot when pulled slip over the projecting wings of the pelvic bones. When this is applied, another bandage is passed between the legs, and fastened posteriorly to the abdominal belt; then it should be fastened to the abdominal belt in front when drawn so as to produce the pressure required on the vulva

By such means most superficial bleedings from these parts can be effectually checked. When the tumour formed by the blood is small, rest and time will generally suffice for the cure. When bleeding has stopped, absorption will set in, and rapidly carry away the extravasated blood. Should the sanguineous tumour be large, however, operative measures would be required for the removal of a clot of blood that could not be carried away by the absorption process, and the greatest care would then be requisite in the after-treatment.

Other tumours of the vulva are occasionally met with, but they are of such rarity as not to require description or enumeration in a work of this kind.

ITCHING AND IRRITATION OF THE VULVA—PRURITUS.—Itching of the vulva is a most distressing and intolerable affection; and it deserves this special character because to all appearance the patient enjoys perfect health, and yet at the same time she suffers from an itching so intense, an irritation so acute, that she is debarred from society by the ever-present desire of scratching the part to relieve her trouble; loses her sleep from the same cause; is constantly troubled night and day, until at last her general health suffers. The itching is only a symptom of some deeper affection, and in order to effect a cure the cause must be discovered. The causes of this symptom are various. Not unfrequently it is the result of a disease of the skin covering the part. The cutaneous surface may have scattered over it small pimples having a red top. These may be the original cause of the irritation, but they also may be the result of the itching, and the scratching and rubbing exercised to relieve it. Eczema is another affection of these parts, and not a very uncommon one, which excites intense itching. It begins as little bladders, with a red border or base. These burst, the skin around becomes red, and after a brief time may become a moist weeping surface. The surface has now a red, shining appearance, and is intensely irritable and sometimes very painful. It is occasionally hot and burning. This acute state may soon pass off, and a chronic stage follows, which often lasts an unlimited time. During the continuance of the chronic condition, successive acute attacks may occur, successive crops of vesicles making their appearance, and running the course already described, leaving the patient generally in a worse condition than before.

It is a very obstinate disease, very rebellious to treatment. The acute, hot, burning condition may be relieved by the application of a mixture of lime water and oil. This should be applied frequently on strips of lint, and the patient should be kept absolutely at rest. All stimulants should be avoided, and the diet should be moderately low.

Great cleanliness should be observed. Ordinary soap should not be used in washing—tar or carbolic soap should be substituted. A regular course of treatment will be necessary to establish health. Treatment must be persevered in for a long time to effect a cure.

But pruritus is more frequently met with without any apparent disease of the skin. It appears that the skin is in these cases the seat of an irritation reflected from other parts. The terminations of nerves are often the seat of the irritations arising in their course. When the skin is to all appearances healthy, we generally find a discharge of some kind, often of an irritating character, from the vagina.

The whites and all the diseases which give rise to them are a cause of pruritus; indeed, amongst the most frequent causes. But though exceedingly common, whites, etc., do not give rise to severe pruritus save in a few cases. It does so when the discharge possesses a very irritating character. Pregnancy is frequently accompanied by a profuse leucorrhœa, and these cases are more subject to pruritus than those in which leucorrhœa is present in the unimpregnated condition. Pregnancy in itself, however, exercises such peculiar influence on the whole system—nervous, cutaneous, digestive, and so on—that it is not easy to say how much is due in such cases to the pregnant state, and how much to the whites accompanying it.

In old age pruritus is also met with, arising from whites. The irritation caused by thread-worms in the bowels gives rise to the most intense itching, which cannot be alleviated until the offending organisms be destroyed.

TREATMENT.—Whatever be the cause of the itching and irritation every effort should be made to relieve this most distressing symptom, and that at once. Relief of this is in the highest degree demanded, because it unfits the patient for all her duties and for all the pleasures of life. At the same time that the most prominent symptoms should be treated and alleviated, the cause of the evil should be traced out. Examine carefully for all the conditions which are likely to cause such symptoms. Should there be leucorrhœa, the greatest cleanliness should be observed. Frequent ablutions with tepid water, or water containing a little Goulard water, should be practised. Injections into the vagina of similar solutions of lead should be practised at the same time. When the parts have been dried by means of a soft towel, the itching parts should be oiled or greased with lard or sweet oil, or powdered with starch and oxide of zinc. Should disease of the vagina or of the uterus be discovered, it should be treated, and the itching meanwhile relieved by poppy-head fomentations, opium, or the application of a solution of nitrate of silver to the surface.

PAIN IN THE BACK.—In almost all diseases of the womb this is complained of. It is situated in the lower part of the back, and is at its height during menstruation. It may arise from other causes, as constipation, lumbago, and disease of the spine.

PAIN IN THE PELVIS AND LOWER PART OF THE ABDOMEN.—This arises from many causes, as fibroid tumour, cancer, or inflammation of the uterus. It is more or less constant. The pain of cancer is peculiar; it is described as having a darting, burning, lancinating, or gnawing character. Pains which are intermittent, which come and go, and which have more or less the character of labour pains, are caused by retention of the menses, abortion, hæmorrhage around the womb (hæmatocele), polypi, clots, or fibroids in the womb, flexion of the uterus, membranous dysmenorrhœa, neuralgia of the uterus.

PAIN IN THE SIDE A LITTLE ABOVE THE GROIN.—This is often due to ovarian irritation or chronic inflammation of the ovary. It is also said to be due to neuralgia of the ovaries. It proceeds to the back and hips, and down the thigh and leg of the affected side. It is sometimes very severe, and is attended by superficial tenderness. Walking or any movement aggravates it—especially jolting movements. It greatly interferes with walking, and gives rise to great fatigue. Displacements of the uterus, displacement of the ovary, congestion and inflammation of the womb, and disorders of the bladder, are said to give rise to similar pain. The pain is usually situated on the left side, occasionally on the right, and now and then on both. The pains occurring with menstruation have already been described.

Sometimes a sudden intense pain is felt in the lower part of the abdomen. It is accompanied by prostration, a feeling of faintness or actual fainting, pallor of the surface, weakness of the pulse, clammy perspiration, sickness, and vomiting. These are symptoms of a severe shock to the system, and are always serious. They should at once be properly attended to.

They may be due to rupture of a vessel in the tissues around the womb and hæmorrhage, or to rupture of the pregnant uterus, to hæmorrhage from an abnormal form of pregnancy called extra-uterine (this is extremely rare), to rupture of an ovarian cyst. Rupture of the pregnant uterus is very rare. It may happen without obvious cause.

Rupture of an ovarian cyst happens occasionally. Sometimes it results in a cure, and sometimes it ends fatally.

The treatment, until advice is obtained, should be absolute rest, and small quantities of stimulants, of which brandy-and-water is the best.

CHAPTER VIII.

DISORDERS OF MICTURITION.

DISORDERS of micturition frequently accompany uterine and ovarian disease. This has already been observed when enumerating the various symptoms which accompany diseases of the organs of generation. In this chapter it will be necessary to do little more than to enumerate the causes of urinary troubles, so that the reader may be able to refer to those causes in other parts of the work.

Micturition may be frequent, but accomplished without pain or difficulty. These cases are very common. They are due to displacements of the uterus, tumours in the pelvis pressing or irritating the bladder; inflammation of the uterus or of any of the parts in the pelvis, as pelvic cellulitis; hæmatocele; dysmenorrhœa; irritability of the bladder, without any special disease; certain conditions of urine, and some diseases of the kidneys.

On the other hand, micturition may be frequent and painful. This depends upon displacements of the uterus pressing on the bladder and urethra; vascular tumour of the urethra; inflammation of the vagina and external parts, and of the urethra and bladder; gravel, stone in the bladder; diseases of the bladder; and certain conditions of the urine.

Micturition is sometimes difficult. This may be due to displacements of the uterus; tumours in the pelvis; displacements of the bladder, as in falling of the womb; tumour of the urethra and vulva or external parts pressing on the urinary passage and diminishing its calibre; stricture, or constriction, of the urethra, or urinary passage; and diseases of the bladder, as cancer, polypus, paralysis, etc.

Micturition is impossible in some cases. Rarely no urine is poured into the bladder, and there is no desire to micturate. This is called suppression, and is due to inaction of the kidneys. In the majority of instances, however, the urine is freely secreted, and finds its way into the bladder, and though the patient makes efforts to urinate, she fails; this is called retention. This condition is due in most instances to obstruction to the passage from pressure caused by tumours, or displacement of the womb. It is also seen in some cases of hysteria. In the last-named class of cases a good deal of pain is complained of in the bottom of the stomach, as well as in other parts of the body. The attacks come on frequently, and are due to a nervous condition. The exact nature of the case can as a rule only be made known by examination.

Micturition is sometimes involuntary. This condition is not very uncommon, and is one of the most distressing affections. It may be present at birth, but this is rare. Young girls frequently are unable to retain their urine during sleep. This condition is generally easily cured by careful watching and by regulating the action of the urinary function. When the girl goes to sleep, she should be made to pass urine. She should again be called up to micturate once or twice, as may be necessary, in the course of the night. The time when the involuntary action takes place should be found out by careful watching, and the calls to urinate should be made just before such times. In this way the habit may be broken, and a better one substituted.

But micturition may be involuntary from defective formation or from disease of the bladder. The most common of these conditions is a fistula, or a communication between the bladder and vagina. In most of such cases, the person has no control whatever over the flow of urine; while in others she has partial control, because while at rest in certain positions the urine is retained for a shorter or longer time, according to the position of the fistula. As a rule, this is the result of severe labours, in which the partition between the bladder and vagina becomes torn through, or crushed to such a degree as to end in ulceration. The fistula is easily discovered on careful examination. There is but one means of cure—that is, an operation for closing the opening. No other treatment can be effectual. Fistula may also be the result of cancer. For this no operation can avail.

Involuntary flow of the urine may result also from pressure caused by tumours of the ovaries, or of the uterus, or of other parts, when they enter the pelvis.

Displacement of the uterus is also an occasional cause of incontinence, especially during pregnancy.

During the later months of pregnancy and after labour, the urine escapes often in an involuntary manner; after labour the condition passes off, and control over the bladder is regained as health and strength are restored.

When there is involuntary escape of the urine, the greatest care is necessary in keeping the parts clean. It is not possible to keep them dry, owing to the constant dribbling. This gives rise to irritation, redness, pimples, or inflammation of the skin and buttocks. To ward off this, warm bathing of the parts should be had recourse to once or twice a day, and after each bath the skin should be perfectly dried and smeared with lard or zinc ointment. It is hardly necessary to say that the diapers should be frequently changed.

CHAPTER IX.

ENLARGEMENT OF THE ABDOMEN—OVARIAN TUMOURS.

THE abdomen may become enlarged from a variety of causes—as pregnancy, dropsy, tumours of the ovary or of the uterus, diseases of the spleen, kidneys, liver, and bowels. Of pregnancy we shall speak at length in another section. Here we shall speak of tumours of the ovary and refer incidentally only to the others.

Tumours of the Ovary may be solid, cystic, or cancerous. The solid tumours are rare, and never endanger life. They do not grow to a large size, and usually cause but little inconvenience.

CANCER OF THE OVARY.—The tumour is situated on the right or left side, between the navel and the hip, in the region of the ovary. It is the seat of pain of a lancinating, darting, or burning character. It is tender to the touch, liable to press upon the veins which return the blood from the lower limbs, impedes the circulation, and gives rise to a puffy swelling of the leg. The patient loses flesh, grows rapidly weaker, becomes irritable, fretful, and depressed in spirits. The tumour usually forms rapidly, and is irregular or lobulated on the surface, though in some cases it is smooth. In course of time the peculiar aspect of cancer is developed. The abdomen may become immensely distended with fluid—dropsy. This is due to the irritation caused by the cancerous mass. Such great exudation of fluid into the cavity of the belly never occurs in any other disease of the ovary. This is a valuable aid in diagnosis. The treatment depends on the character of each individual case. In one it is advisable to remove the growth by operation, with a view to prolong life, though perhaps not to absolute cure; in another such an operation is impossible.

CYSTIC TUMOURS OF THE OVARY, OR OVARIAN DROPSY.—These are sacs or cysts containing fluid. Sometimes there is but one cyst present, and that a simple one, containing a single cavity only. In other cases, a cyst contains a number of cavities distinct from one another, or several smaller cysts within itself; such a tumour is called a multi-locular cyst. In a third class of cases, several cysts grow side by side; they may unite and form a single tumour, or they may remain more or less separate.

The contents of the cysts vary in character. They may consist of a pale, straw-coloured fluid, almost like urine in appearance, or of a thick, viscid, gelatinous substance, which may have a pale, or a brownish, or even dark colour. In some rare cases, skin, bone, hair, teeth, and fatty matter have been found within ovarian cysts.

We know but little of the origin and causes of these morbid growths. They are rare under twenty, most common between twenty and forty. At the same time they have been seen in youth, and even in childhood, nor is old age exempt from them. Child-bearing is generally believed to prepare the ground for their development; but, as the great majority of women are or become mothers at some period of their lives, this belief has little in its favour. Moreover, it is not uncommon to see cysts of the ovary in the unmarried and childless. General weakness, bad nutrition, general pallor, or chlorosis, are said to predispose to the formation of these cysts. In favour of this, it may be said that the majority of the subjects of this kind of tumour are out of health. Scrofula again appears to favour their development. Disorders of menstruation frequently accompany and precede the growth of ovarian tumours, and are said to favour their development. In these cases, however, it is more likely that there is something radically wrong with the generative organs, and that the menstrual disorder as well as the ovarian growths are due to the same cause, than that the menstrual disorders bear a causal relation to the ovarian tumours.

SYMPTOMS AT THE BEGINNING OF OVARIAN TUMOURS.—There are usually few, if any, symptoms which attract attention. In some cases menstruation is disordered, but this symptom is of so common occurrence where ovarian disease is not present, that it would not lead to the least suspicion of the existence of ovarian dropsy. Again, in other cases where cysts grow in the ovary, menstruation may be performed regularly and normally; and pregnancy may even occur, and run its course to a happy termination. In many cases, however, soon after the commencement of the disease there is a dull pain felt in the region of the affected ovary, a sense of fulness, weight, dragging, and irritation. There may be a slight swelling—smooth, resistant, but not tender—discovered on careful investigation. So long as the tumour remains in the pelvis, it may give rise to very serious troubles by its mechanical effects. It presses on the bladder, giving rise to frequent or difficult micturition, or even renders urination impossible. On the other hand, the pressure exercised by it on the rectum or bowel gives rise to constipation, or alternately diarrhoea and constipation, and bleeding piles. Pressure on the blood-vessels causes swelling of the lower extremities.

When the tumour rises from the pelvis into the cavity of the abdomen, its presence is more likely to attract attention. The symptoms above enumerated are present only when the organs in the pelvis are seriously pressed upon by the tumour. In some cases this does happen, but the tumour readily ascends into the cavity of the abdomen without the occurrence of any such troubles. In that case the growth may attain a considerable size before its existence or the existence of anything wrong is suspected. Its discovery is in some cases accidentally made by the patient or by her doctor. In other cases, there is a consciousness of abdominal enlargement; there is a sense of fulness, and the clothes are felt tighter than they should be. At first, the swelling or tumour is situated on one side. As it grows, however, it extends upwards, and towards the middle line of the body, and ultimately extends across that line, filling both sides. These tumours vary much in size: they may reach up to the breast-bone, filling the whole of the abdominal cavity, driving the intestines upwards and backwards, and encroaching upon the cavity of the chest. On the other hand, they may be so small as not to be discoverable on the most careful investigation made during life. They are at first movable, and may remain so throughout their course; but in most instances they set up inflammation in the cavity of the abdomen, which ultimately renders them fixed.

Occasionally they give rise to incontinence of urine. The contents of the bladder escape involuntarily. Sometimes they cause complete obstruction of the intestines, either through direct pressure, or through the inflammation set up by them. In this case there is severe pain and vomiting, and, unless operative relief is obtained, death is inevitable. When the tumour has attained a large size, the skin of the abdomen presents white lines from the over-stretching, the legs swell, and the veins become enlarged, varicose, and inflamed from the obstruction to the return of the blood to the heart; the liver and midriff are pressed upwards; the cavity of the chest is encroached upon; the bases of the lungs are pressed upon, so that air cannot enter, they become collapsed, and difficulty of breathing and palpitation of the heart ensue.

In this way all the organs in the body become interfered with, their functions become performed imperfectly, nutrition is impaired, sleep is lost, food cannot be taken in sufficient quantity, the patient is unable to lie down, nor can she walk about, she wastes, becomes thinner, hectic fever sets in, and she dies exhausted, or is carried away by some intercurrent disease.

The manner of growth of ovarian cystic tumours is uncertain. In some cases they grow slowly, but still regularly increasing in size; in other cases they grow rapidly, and attain in a brief space of time a large size; while in other cases they remain stationary for months or

even years, and then grow again. Ovarian cysts occasionally undergo spontaneous cure. The fluid contents are absorbed, and the cyst wall shrivels up. This, however, is a very rare termination; and when disease is permitted to take its own course uninterfered with, serious consequences may follow.

The cyst wall may give way, and the contents be poured into the cavity of the abdomen. In some cases no harm follows from this; while in others, in which the fluid has irritating properties, inflammation is set up, and death is almost inevitable. In those cases where the fluid is innocuous, a cure may be effected, or the opening may be closed, and the cyst may fill again.

The pressure of the cyst on the bladder may cause absorption of the wall of the cyst and the wall of the bladder at the point of contact. In this manner the contents of the cyst are poured into the bladder and evacuated, and recovery happens. The discharge may take place also by the intestine.

Inflammation frequently takes place in the peritoneum around the cysts. In this way it contracts adhesions to the neighbouring parts. But the cyst itself may become the seat of inflammation. This inflammation is of a low kind, and always ends in the formation of matter. In fact, the cyst becomes a huge abscess. The signs of this condition are pain in the cyst, heat, fever, and shivering. When the temperature runs high, "emaciation is progressive, appetite lost, throat troublesome, sleep disturbed, nausea or vomiting distressing, and the abdomen tender on pressure, with hurried pulse and respiration; it is extremely probable that one or more cysts contain pus; and when these symptoms are present in an extreme degree, or have lasted a considerable time, the pus has become fetid."

When the cyst is freely movable in the abdomen, it may be twisted on its stem or pedicle. The result is a strangulation of the vessels conveying blood into the tumour. The blood cannot return along the veins; they become distended, and ultimately burst, giving rise to bleeding, with perhaps great distension and rupture of the cyst, which may end fatally.

Sometimes the contents escape by the fallopian tube into the womb, and out by the vagina. This is a very favourable termination. The opening may remain permanently patent, and thus allow a drain of fluid, as it is secreted by the contracted sac.

Occasionally death occurs suddenly, without any apparent cause. This happens in cases where the tumour has attained a great size, where the abdomen is immensely distended, the lungs pressed upon, and the action of the heart interfered with.

The breasts sometimes suffer sympathetically in these cases. They

become swollen, hard, nodulated, and painful. Sometimes they present characters similar to those seen during pregnancy.

TREATMENT.—Until recently the treatment of these tumours was of a very unsatisfactory character, for medicines have no effect, either in arresting their growth or promoting their absorption.

Operative means alone can effect a cure. There are two operations one of which is usually performed in such cases. One is to tap the cyst, and let out its contents: it is palliative only. Occasionally, however, it effects a cure; but in the great majority of cases the cysts soon fill again.

The other is removal of the cyst. Within recent years this operation has been brought to a great degree of perfection; and though it, like all other operations, is not unattended by danger, yet it gives the only chance of a perfect cure, and the best chance of prolonging life.

CHAPTER X.

THE SIGNS OF PREGNANCY.

THERE is no question of greater interest to women or to the human race than the creation of a new being. This is a process which takes a considerable time to run its course, and the state of the woman in whose body this process of development is going on is called pregnancy. In whatever state or position a woman may be, the signs and symptoms of this condition are such as necessarily to attract her attention. The majority—the very great majority—of women who attain adult life become mothers, and to them the question we are about to discuss is of supreme importance.

It is not very many years since the discovery of pregnancy with absolute certainty has become possible. Before this, another discovery had to be made—that of the stethoscope and auscultation. The discovery of the heart's sounds had again to be made before the stethoscope became applicable to the diagnosis of pregnancy. These were gradual steps, each of which met with much opposition. In the present day, it would not be possible for anyone to mislead neighbours and physicians by simulating pregnancy, for the fraud would be at once detected. Many years ago, however, Joanna Southcote declared herself pregnant by the Holy Ghost, obtained a number of followers who believed in her, and led medical men to state that she was pregnant, and yet it was found after her death that she had never conceived.

During the early months of pregnancy, however, it is not so easy as it may at first sight appear to decide if pregnancy be present or not. It is the custom of the law to refer a prisoner who declares herself to be *enceinte* to a jury of matrons, and they have to decide; but their decision can never be of any great value, for it requires the greatest skill to answer the question with certainty, even during the later months of pregnancy, while during the earlier months the best skill can at best attain to probability only, but it is at the same time probability amounting almost to certainty.

The time of life at which pregnancy is possible is a matter of importance to bear in mind. It is the time which extends from puberty to the change of life. This is called the fruitful period of life, or period of sexual activity. As a rule, it is the period during which

the monthly courses return regularly—that is, between the fourteenth or fifteenth year and the forty-fifth or fiftieth. There are, however, rare instances of pregnancy occurring before the fourteenth year. In India, pregnancy occurs sometimes as early as the tenth or even ninth year. A case is known to have occurred in England in which a young girl gave birth to a full-grown child soon after she had completed her eleventh year. This is the earliest age at which pregnancy has been known to occur in England.

As to the latest age at which pregnancy may take place, it may be said that, though the menses may have ceased to appear, yet it is possible for conception to take place even afterwards. The menses in some cases disappear for a time, and again return after an interval of a few months or years. The menses may continue to return regularly to a great age. Haller states that he delivered one woman in her sixty-third and another in her seventieth year.

The sex of the child is in some places the first question the midwife has to decide on being called to a patient, and the rules according to which this is to be determined are somewhat amusing. Hippocrates said: "A woman with child, if it be a male, has a good colour; but if it be a female, she has a bad colour." And again, "The male foetus is usually seated in the right, and the female in the left." In one of the oldest works in English on midwifery, it is stated—"But if ye be desirous to know whether the conception be man or woman, then let a drop of her milke or twaine be milked on a smooth glasse, or a bright knife, other els on the nail of one of her fingers, and if the milk spread abroad upon it by-and-by, then it is a woman child; but if the drop of milke continue to stand still upon that which is milked on, then it is a signe of a man child.

"Then, if it be a male, then shall the woman with child be well-coloured, and light in going, her belly round, bigger towards the right than the left (for commonly the man childe lyeth in the right side, the woman in the left side), and in the time of her bearing she shall better digest and like her meate."

Of course the above rules are of no value, because they are not true, as may be proved any day; and it is only the most absurd credulity that ever puts any faith in them. There are, however, some reasons for believing that the ages of the parents exercise some influence on the sex of their offspring, because it appears that when the father is older than the mother more male than female children are born; when younger, more females than males. Attempts have also been recently made to determine the sex of the child by the auscultatory examination of its heart. When the number of the beats of the child's pulse amounts to from 144 to 160 per minute, the child is said to be

female; when from 120 to 140, it is said to be male. There is probably some truth in this, and a fair guess may be made by this method of the sex of the child unborn. But this method is far from certain. Indeed, though in a majority of cases it may even prove correct, it will prove to be false in a large minority. It appears that the frequency of the pulse is more directly related to the size and weight of the child than to the sex, so that a big, strong, heavy child has a slower pulse than a small, weakly, and badly-nourished one. Supposing, however, that the children were healthy in any number of given cases, the male would almost in each case weigh more than the female, so that the weight which favours slow pulse would be in the male sex. Thus it is seen that there is some truth in the observation that sex can be discovered by the pulse.

Some curious cases of pregnancy occur where the condition remains quite unsuspected throughout the whole time, and even for the first hours of labour. The late Dr. Tanner reports the following case:—

“I was sent for on Thursday morning, 17th of April, 1862, at nine o'clock, to see Mrs. G——, forty-two years of age, who had been suffering great pain in the abdomen since eleven o'clock on the preceding night. This lady had previously sought my advice on some half-dozen occasions. She had last consulted me at the beginning of March for an attack of indigestion, on which occasion no mention was made of any enlargement of the abdomen, nor was there any swelling perceptible through her dress. Her history is that she has been married for rather more than three years (since February, 1859), and that she has never been pregnant. The catamenia were lost on some time in June, 1861, but as they had been very scanty for five or six months before, this circumstance did not particularly attract her attention. In fact, she attributed the sensation to the change of life.

“On my arrival at the patient's house, I found her in bed, complaining of great abdominal pain, which had kept her awake the whole night. Her husband and her mother-in-law were present, as well as a married sister who had borne children. I was told that Mrs. G—— had not been well for a fortnight, her breath having been short on making any exertion, and her legs having become swollen. On Wednesday night, at eleven o'clock, she suddenly began to suffer from pain in the stomach, for the relief of which her friends applied a mustard poultice. At two o'clock, a.m., the sufferings were so great that a neighbouring medical man was sent for. This gentleman was unable to attend, but sent his assistant, who was said to have stated that the illness was due to ‘flatulence and inflammation of the bowels.’ He gave a bottle of medicine, the second dose of which, however, caused sickness, and failed to afford any relief.

"On examining the abdomen, I discovered an oval tumour distinctly occupying the right side, and extending from the pelvis to some two inches above the umbilicus. It seemed to be about the size of the adult head; but although the abdominal parietes were thin, the tumour was by no means distinct to the sight, though it was readily made out on palpation. On making a vaginal examination, I found the os uteri dilated to the size of a crown-piece, and the head of a fœtus entering the brim of the pelvis with the vertex presenting. The membranes were ruptured; but the patient was not conscious of any discharge of water having taken place, and there was no appearance of moisture on the bed upon which she had been lying all night. On inspecting the breasts, a narrow brown areola was seen; but it certainly did not exceed half an inch in width. When Mrs. G—— was asked if she had felt any movement in her abdomen, she allowed that she had occasionally experienced curious sensations for some weeks past, but these were attributed to flatulence. During the whole period of pregnancy there had been neither sickness nor any feeling of nausea. The moderate increase in size which was perceptible had been attributed to the natural deposition of fat, for all the members of her family are disposed to be stout.

"As the pains were not violent, and the head did not advance, I left the case at nine o'clock, after explaining its nature; but the explanation was received with incredulity, neither the patient nor her husband having the slightest suspicion that pregnancy existed. The sister, however, took steps for obtaining the loan of baby-linen, etc.

"At half-past one in the afternoon, when I returned, the pains of labour were strong and of frequent occurrence. The head was low down, and the parts fully dilated.

"The child (a female) was born with animation suspended; but by a persevering use of artificial respiration, it was resuscitated at the end of half an hour. Although small, it seemed to be a mature infant. She has since become strong and healthy."

Dr. Tanner remarks on the above case:—"The history, however, seems to establish the fact that a woman may conceive, may go the full time of gestation, and may be in labour for ten hours, without having any suspicion that she is pregnant. It ought perhaps to be mentioned that, from all I have seen and heard of Mrs. G——, no doubt whatever is entertained but that her statements may be taken as strictly true. Independently of this circumstance, it so happens that both parents, though they despaired of ever having a child, were both anxious to have one; and the birth of the little girl was therefore regarded as the happiest event which could befall them."

Other cases have been recorded bearing on the same point, and the

fact that pregnancy may occur and its subject be unconscious of it is put beyond dispute.

Cases happen also when women imagine themselves pregnant when they are not. These will be referred to later on.

That women fall into such errors may appear at first sight strange, but a consideration of the signs and symptoms of pregnancy will tend to lessen the wonder that the above statements may have called forth, inasmuch as it will then be seen that there is no sign of pregnancy of which the woman herself can be cognisant which may not be simulated by disease. Though the symptoms which attend or are associated with the state under consideration are numerous, they are not all of equal value, and very few of them are absolutely diagnostic of pregnancy; and these few may elude the observation of a skilled physician.

SUPPRESSION OF THE MENSES.—One of the earliest symptoms of conception having taken place is the suppression of the menses. The menstrual flow does not return at the expected time. This is the general rule, and when a married woman finds that her courses do not appear at the time they are due, she regards herself as being pregnant; and she is usually right in doing so. The rule is, however, not without exception, and therefore too great reliance should not be placed on the fact of menstrual suppression by itself. The menses are not always stopped when conception has taken place. For several months—three, four, or five—the discharge may return regularly, though the woman is pregnant. Cases have occurred, indeed, in which they have returned every month throughout the whole period of pregnancy. Women who had never menstruated have become pregnant, and during their pregnancy have had a menstrual flow every month. Such cases are rare; but the fact of their occurrence is quite enough to invalidate the symptom under consideration as a sign of pregnancy.

Besides, we have already seen that the menses may be suppressed through many other causes than the occurrence of conception. In newly-married young women, it is not uncommon for two or three periods to be missed without any known cause. The young wife believes herself pregnant, but she soon finds out her error.

NAUSEA AND VOMITING.—Another symptom which appears at an early period of pregnancy is sickness. It usually makes its appearance soon after impregnation, and lasts for two or three, or even six months. It may, indeed, continue throughout the whole term of pregnancy. In others, again, it does not come on until the later months. The vomiting is worse in the early part of the day, and has consequently been called "morning sickness." It is hardly necessary to state that its

value as a sign of pregnancy is very slight, as it may not only be altogether absent, but similar vomiting may be due to numerous other causes. The vomiting of pregnancy is not due to indigestion, but to a sympathy with the uterus—an irritation of the stomach arising from the condition of the womb. It is considered when not excessive as a good sign, for it is said that "a sick pregnancy is a safe pregnancy."

Together with vomiting, there is often heartburn, waterbrash, pain in the pit of the stomach, and degraded appetite. The woman loathes her usual food, and longs for indigestible and injurious substances. Sometimes there is great increase in the secretion of saliva. Water runs from the mouth almost in a constant stream. Sometimes there is diarrhœa.

CHANGES IN THE BREASTS.—The breasts are organs which sympathise in a very remarkable manner with the womb. When there is disease or irritation of the latter, the former often become painful and swollen. But this sympathy is more marked during pregnancy than in any other condition. At an early period after conception the pregnant woman begins to feel peculiar sensations in the breasts—a feeling of discomfort, soreness, and even pain: soon the organs begin to feel tense, and to throb. About the end of the second month they usually become hard, uneven, and knotty; the blue veins which run under the cutaneous cover become larger and more marked; the dark area around the nipple (the areola) becomes deeper coloured, and large, moist, and uneven on the surface. White lines soon make their appearance on the mammary surface, radiating from the nipples as a centre. Milk or a milky fluid may be made to exude from the nipple on pressure; but this, though popularly regarded as a sure sign of pregnancy, is by no means such. Indeed, no sign can be of much less value when taken, not in conjunction with others, but alone, for milk has been seen in the male breasts, and even in those of new-born babes.

The secretion of milk may also be kept up for years in the breasts of those who have once been pregnant, or it can be excited after even years of suspension. Dr. Livingstone, in his "Missionary Travels and Researches in South Africa," relates the following curious examples:—

"Masina of Kuruwan had no children after the birth of her daughter Sina, and had no milk after Sina was weaned, an event which is usually deferred until the child is two or three years old. Sina married when she was seventeen or eighteen, and had twins; Masina, after at least fifteen years' interval since she last suckled a child, took possession of one of them, applied it to her breast, and milk flowed, so that she was enabled to nurse the child entirely. Masina was at this

time at least forty years of age. I have witnessed several other cases analogous to this. A grandmother of forty—or even less, for they become withered at an early age—when left at home with a young child, applies it to her own shrivelled breast, and milk soon flows. In some cases, as that of Mabogosing, the chief wife of Mahure, who was about thirty-five years of age, the child was not entirely dependent on the grandmother's breast, as the mother suckled it too. I had witnessed the production of milk so frequently by the simple application of the lips of the child, that I was not therefore surprised when told by the Portuguese in East Africa of a native doctor, who, by applying a poultice of the pounded larvæ of hornets to the breasts of a woman, aided by the attempts of the child, could bring back the milk. Is it possible that the story in the 'Cloud of Witnesses,' of a man during the time of persecution in Scotland putting his child to his own breast, and finding, to the astonishment of the whole country, that milk followed the act, may have been literally true? It was regarded and quoted as a miracle: but the feelings of the father towards the child of the murdered mother must have been as nearly as possible analogous to the maternal feeling; and as anatomists declare the structure of both the male and female breasts to be identical there is nothing physically impossible in the alleged result. The illustrious Baron Humboldt quotes an instance of the male breast yielding milk; and though I am not conscious of being over-credulous, the strange instances I have examined in the opposite sex make me believe that there is no error in that philosopher's statement."

Of all the changes which take place in the breast during pregnancy those in the areola are the most important and most trustworthy. They begin about the second month in a deepening of the hue, a tumescence, a moistening of the surface, and an enlargement of the small glands on them.

Dr. Montgomery has described these changes as follows:—"During the progress of the next two or three months the changes in the areola are in general perfected, or nearly so, and then it presents the following character: a circle around the nipple, whose colour varies in intensity according to the particular complexion of the individual, being usually much darker in persons with black hair, dark eyes, and sallow skin than in those of fair hair, light-coloured eyes, and delicate complexions. The area of this circle varies in diameter from an inch to an inch and a half, and increases in most persons as pregnancy advances, as also does the depth of colour. I have seen the areola at the time of labour almost black, and upwards of three inches in diameter, in a young woman of very dark hair and complexion; while in another instance its breadth around the base of the nipple did not at any time

of the gestation amount to a quarter of an inch, and at first was not more than an eighth. This circle, however, narrow as it was, was studded at nearly regular intervals with the glandular tubercles, which were not unlike a ring of beads." Around the deep-coloured circle immediately surrounding the nipple appears another ring of a much fainter tint, called the secondary areola. This has a mottled appearance, which has been aptly compared to the effects of drops of rain falling on a tinted surface, and discharging the colour. This symptom is more valuable in a first than in a subsequent pregnancy, for after the first the areola remains permanently larger and darker.

The dark colour is due to a deposition of pigment in the skin. Similar pigmentary deposits are met with elsewhere. There is often a dark line running from the pubes up to the navel, and from thence on again to the lower end of the breast-bone. Around the navel it forms a dark circle: a dark circle is sometimes also formed round the eyes. Discoloured patches are occasionally seen on other parts of the body—as the forehead, face, or neck—which may disappear after labour, but may remain permanently.

Soon after conception the womb begins to grow rapidly: it becomes heavier, and sinks lower in the pelvis. This gives rise to a flattening of the abdomen below the umbilicus—between that point and the pubes—and has given rise to the French proverb—“*En ventre plat, enfant il y a.*” At this time there is frequently some urinary trouble—a frequent desire to pass water. From the third to the fourth month the womb, which had sunk somewhat in the pelvis, has attained a size too large for that cavity to contain it, and consequently it rises into the cavity of the abdomen. Now the abdomen, instead of being flattened, is swollen; the woman feels herself larger, her clothes are tight, and she has a sense of fulness. At the same time the womb may be distinctly felt as a round, globular, smooth mass rising from the pelvis.

The womb itself has also undergone marked changes—changes in shape and consistence. The neck has become enlarged, very much softer, and its opening bigger. The glands on its surface are more marked, and can be easily felt. The circulation through the organ has much increased, and the lining membrane of the neck and the vagina has become darker and of a livid or violet colour.

A symptom which is popularly regarded as an absolutely certain sign of pregnancy is the sensation felt by the woman and called “quickening.” The term was applied to convey the erroneous idea that the child then became alive or quick, and that it was not so before that event. This is known to be incorrect, inasmuch as the child or embryo is alive from the first, though its life is a lower

form of life than it is after the fifth or sixth month, just as the life of a child an hour before birth is a lower form of life than that it possesses an hour after birth. Marvellous statements have been made, and discussions carried on, as to the time when the child first possesses a soul, but we cannot say that this mystery has been made any clearer by any statements that have been made regarding it. Let it suffice here to say that from the time of conception there is life in the embryo, simple though it is when compared with the higher life of a born child or an adult man, yet too complex to be solved by the greatest philosopher.

There can be no doubt that quickening is of some value in the diagnosis of pregnancy. At the same time its value has been greatly over-rated. It is thought by women generally not only to mark the time when the embryo first starts into life, but also to occur always at the middle of pregnancy—at about four and a half months. Usually it happens about the end of the fourth month, or, to give a wider range and be more accurate, between the fourteenth and eighteenth weeks. It sometimes takes place earlier—as early as the tenth week—but this is very rare. In many cases it does not happen until much later, and in some not at all.

The sensation felt at the time is described differently by different women. They say it is a peculiar flutter, a tapping, or a pulsation or a thrill in the region of the womb, sometimes a tremulous motion like that of a little bird held in the hand. Dr. Montgomery describes the phenomena as follows:—"Under ordinary circumstances when quickening does occur, but especially if it happens with the sudden ascent of the uterus from the pelvis, the woman is apt to feel an unusual degree of nervous agitation, which not infrequently ends in faintness, or even complete syncope, after which she is sensible of a slight fluttering sensation, which from day to day becomes more distinct, until she fully recognises the motions of the child."

The causes of these phenomena are a matter of question, and subject to considerable difference of opinion. Some believe that they are due to the movements of the child, and that the mother at that time becomes conscious of them for the first time—this is the more generally received opinion; others believe they are due to the sudden ascent of the womb from the pelvis to the abdominal cavity; while a third party refers them to the first contractions of the uterine wall. It is probable that the three views are correct, for the sensations described by different women must be ascribed to different causes. In one case they are due to the movements of the child, in another to uterine contractions, and in a third to sudden ascent of the uterus; but more than one may co-operate in producing the sensation.

From this time onward the mother becomes more conscious of peculiar sensations, and there is no room to doubt that these sensations are due to the movements of the child—that is, when pregnancy is present. We say when pregnancy is present, because we shall see by-and-by that such sensations ascribed to the movements of the child are felt by women who are not pregnant, even by women who have had children, and therefore know the character of the sensations due to the child's motions in the uterus. Some women feel these sensations only in a very slight degree; others, again, feel the greatest annoyance, discomfort, and even pain from them—they cannot sleep, and therefore seek advice with a view to control them; others, again, never feel the child at all from the beginning to the end of pregnancy.

Again, it not unfrequently happens that women believe themselves pregnant, and have many or all the subjective sensations associated with that state, while in reality they are not in the family way. These are very peculiar cases. They may occur at any age from twenty-five to fifty, but usually about the change of life—during the “dodging-time.” Often this happens to women who wish to believe they are in an interesting state, and are desirous of having a family. But it happens also to women who have had several children, who ought to know what the sensations and feelings associated with pregnancy are, and who have not the least desire to have an addition to their already large families. Several such cases have come under our observation, and in some cases we have found it impossible to persuade them of their error. Time alone—that great solver of intricate questions and knotty points—will convince them of their mistake; and even against its unanswerable arguments they persevere in their belief (for after the usual period of pregnancy has elapsed, up to the tenth, twelfth, fourteenth month, or even longer, they prove faithful to their creed), until finally they renounce it for very shame.

The causes of these abnormal sensations are various: it may be a false conception, a tumour of the uterus or ovary, some disease of the organs of generation, twitching of the muscles of the abdomen, retention of the menstrual discharge in the womb, movements of gas in the intestines, or an unnatural pulsation of the large vessels of the abdomen. We have said enough to show that quickening—though a valuable sign of pregnancy—cannot be depended upon as a sure sign of that state.

After the time of quickening—or, more accurately, after the womb has ascended from the pelvic into the abdominal cavity—the organ rapidly grows in size, and the abdomen enlarges. At the fifth month the upper border of the uterus reaches to a point midway between the pubes and the navel. The navel, which had hitherto been considerably depressed, becomes now less so. In the sixth month the womb reaches

to a level with the navel, and the navel itself is almost on a level with the surrounding surface—the depression is almost effaced.

In the seventh month the womb is still larger, and inclined to the right side, and reaches to a point midway between the navel and the lower end of the breast-bone. The depression of the navel is quite effaced.

In the eighth month the organ reaches the lower end of the breast-bone, and becomes wider. The navel itself is not only not depressed, but is now pushed forward and prominent beyond the neighbouring surface.

In the ninth month the womb sinks somewhat lower, and the navel becomes still more prominent.

During these—the last four months of pregnancy—the symptoms become more marked, and certain indisputable signs of the condition make themselves manifest. These refer chiefly to the child, and most of them require special knowledge and skill for their detection and recognition—especially knowledge and skill in auscultation, though others may be obtained by careful manipulation or palpation.

If the hand be laid flat on the abdomen, and retained there for a little time, certain peculiar movements will be felt. These may be due to three causes. In the first place they may arise from the contraction of the uterus itself. In this case the tumour formed by the gravid womb becomes harder, firmer, more tense and resisting, and after a while relaxes again. These contractions take place at intervals from the fourth or fifth month; indeed, from the time the uterus can be felt in the abdomen until the end of pregnancy.

But if the hand be still retained in the same position on the abdomen, other movements will soon make themselves felt. These are little blows or kicks given suddenly—perhaps two or three in succession—and then all is quiet again. They may, however, be continued for some time, especially during the later months; indeed, as has been already stated, they may be so frequent and strong as to be a source of great annoyance, and even of sleeplessness.

Other sensations may be felt by this method which are unconnected with the womb, and these may be mistaken for those produced by the movements of the child or the contractions of the uterine wall. They are due to the sudden contraction of the muscles of the wall of the abdomen, or the movements of gas in the intestines. In some cases it is difficult to distinguish between the sensations felt from this cause and those arising from pregnancy, for both may have very much the same characters; so that feeling movements in the abdomen, unless they can be distinctly recognised as due to the motions of the child, is not a sure sign of pregnancy.

Another sign is repercussion or ballottement. This may be practised by simple abdominal palpation, or through the vagina. The latter method is more generally adopted by physicians, inasmuch as it is more certain in its results. The sign depends upon the fact that the child is a solid body floating in a fluid, and that certain movements can be given to that body so as to make its presence felt. If the woman lie on her side, and a hand be laid flat on the abdomen under the projecting womb, so that a hard resistance be felt, and then a smart sharp jerk upwards be given, this feeling of hard resistance will disappear, and immediately afterwards a perceptible tap will be felt, and the feeling of resistance returns. These phenomena are explained in the following manner:—By the sudden jerk the child, which has gravitated to the lowest possible position, is pushed upwards, floating in its surrounding fluid; immediately, however, it begins to descend again by gravitation, and strikes the wall of the uterus at the spot where the hand is applied.

This is not a certain sign of pregnancy, though in the infinite majority of cases it may be relied upon: yet the sign may be obtained in other conditions than pregnancy. For instance, in some rare forms of ovarian tumours a solid body is found floating in the fluid of a cyst—a condition which would give rise to repercussion or ballottement under proper manipulation. The known rarity of such cases, however, renders the ballottement a valuable sign of pregnancy.

But by palpation or manipulation through the abdominal wall much more may frequently be learnt than simply the existence of pregnancy. If the walls of the abdomen be not too rigid or too thick from the deposition of fat, the shape of the child can be, without much difficulty, made out; its limbs, its buttocks, its back, and its head can be distinguished, and in this way the exact position which it occupies may be recognised. Moreover, by taking advantage of this knowledge, one of the greatest recent advances in midwifery and the treatment of labour has been attained.

Knowing the position occupied by the child or fœtus in the womb, knowing that it floats therein surrounded by a fluid, and knowing that by slight force it can be easily moved in that fluid, it became evident that by careful and well-directed manipulation the position of the child could be altered at will, and practice has abundantly proved the accuracy of the inference. When it is known that the child occupies an unnatural position, or a position which is unfavourable to birth, or which renders labour prolonged and consequently dangerous to the mother and child, advantage may and should at once be taken of the power of changing the position of the child in the manner described into a more natural or favourable one. In

this way great and serious danger may often be avoided. This method of "turning," as it is called, is one of the greatest triumphs of modern obstetric art.

But by far the most reliable of all the signs of pregnancy is the beating of the child's heart. This is an absolutely certain symptom of that state, and with ordinary care no other can be mistaken for it. Indeed, nothing can simulate it so as to deceive a careful observer. It requires for its recognition, however, a skilled observer, an educated ear. It is known that by listening over the heart of a grown-up person certain sounds are heard. These sounds are double, and repeated about seventy or eighty times a minute, and are produced by the action of the heart. In a similar manner the heart of the child produces double sounds, which become audible by means of the stethoscope about the fifth month, and continue to increase in loudness from that time up to the end of pregnancy. They are heard generally over a limited spot of the abdomen. The position of this spot varies in different cases, and in the same case, according to the position of the child. The sounds are much more frequent than the sounds of the mother's heart or the beat of her pulse, being from 120 to 160 a minute. The sounds are double, and have received the name of "tic-tacs," from their resemblance to the sounds of a watch. Several things may be learnt, with a certain degree of probability, by observing the character and position of the sounds of the child's heart. As the place in which the sounds are heard is a very limited area, and varies in position with the position of the child, the latter can to a certain extent be inferred from the former. Moreover, recent investigations go to show that the number of the sounds per minute varies more or less with the sex of the child. If the pulse be very quick, the child is a female; if slow, the child is a male. The question has already been discussed.

Besides, it is possible by auscultation to detect in some cases twin pregnancy. If two distinct fetal pulsations can be heard, audible at distant spots of the abdomen, there can be but one inference—that is, that there are two hearts producing the two pulsations; and if two hearts, then two children.

When the fœtus is dead, the heart does not beat, and the heart sounds are not produced, and consequently cannot be heard, so that pregnancy may exist without fetal heart sounds. In some cases also of ordinary healthy pregnancy it is not possible after the most careful examination to detect the heart sounds; so that, though the presence of the sounds of the child's heart is an indisputable sign of pregnancy, yet the absence of such sign does not negative the condition.

Another sign of pregnancy is the funic souffle. It is the sound produced when the funis or chord is pressed upon. It is, however, very

rarely audible. When heard, it is a sure sign of the presence of pregnancy.

The uterine or placental "souffle or bruit" is yet another sign of the state under consideration. It becomes audible about the fourth month of pregnancy. It comes and goes. It is heard for a short time, then disappears, and again returns in a short time. Various theories have been advanced with regard to the mode of its production. It is not characteristic of pregnancy. It, or a sound similar to it, is often heard in other conditions, as when fibrous tumour is present.

Besides these, many other sounds may be heard over the abdomen; sounds due to the movements of the child—these are dull thuds accompanied by a sudden jerk or impulse; sounds due to the movements of gas and fluids in the intestines, etc.

It is evident, then, that there are only two absolutely sure signs of pregnancy, and these can be recognised with certainty by a skilled observer only—an observer skilled in auscultation and manipulation. These signs are the sounds of the heart of the child or fœtus, and the sensations produced by the different parts of the child, so as to distinguish those parts. It is not enough to recognise the presence of a solid body floating in a fluid, though this would supply evidence of the probability approaching to certainty of the presence of pregnancy; but the condition is met with, though infinitely rarely, in tumours. On the other hand, the sounds of the fœtal heart cannot be simulated, and though pregnancy may exist and the sounds be not present (as when the child is dead) or inaudible; yet, when heard, there can be no question about the diagnosis.

The condition of the nipple and its surrounding coloured ring has been said to be absolutely characteristic: in most cases, doubtless, it is characteristic, but disease may give rise to a condition of breasts undistinguishable from that of pregnancy.

During the later months of pregnancy, then, certain sure signs of that condition may be discovered by auscultation and palpation, or manipulation of the abdomen, but during the earlier months no such signs are discoverable; yet, by a careful examination of the breasts, abdomen, and womb through the vagina, a conclusion may be arrived at possessing an amount of probability approaching to certainty.

Besides the symptoms enumerated, many curious changes in the dispositions, habits, and constitutions of women occur now and then during pregnancy, and though these cannot be accounted as symptoms of that condition in the generality of women, yet in those in whom they have occurred once they may be so considered. Changes of disposition, for instance, sometimes happen during this period. A good-tempered woman and well disposed may become irritable and malicious;

fortunately, on the other hand, every now and then a stepmother, who is the terror of the smaller members of the family, becomes the light of the household—kindness itself. Some women lose their memory, others sight, others their voice, to regain them again after labour. Nervous disorders of pregnancy take every shape and form. Sometimes, instead of the loss of a sense, it is the gain of one that occurs. Women who are melancholy and pensive, and even imbecile, have regained the perfect use of their mental faculties during pregnancy, to lose them again after parturition. Women who are deaf have regained the sense of hearing. Such occurrences are at present inexplicable, but they are doubtless due to an increase of nervous sensibility.

CHAPTER XI.

THE DURATION OF PREGNANCY.

THIS is a subject in which every member of society, and especially every woman, is interested. Considering the frequency of the occurrence of the condition, and, as might be thought at first sight, the material at hand for the question, it would seem strange that it is even now a disputed question. There is, however, no doubt, and all are agreed upon this point, that the average duration of pregnancy is about nine calendar or ten lunar months—from 273 to 280 days. But at the same time, there is equally little doubt that the duration of this state may vary, but to what degree this variation may amount has been the subject of hot debate. The law of England does not fix the limit of variation, and wisely. Blackstone says:—"From what has been said, it appears that all children born before matrimony are bastards by our law; and so it is of all children born so long after the death of the husband, that by the usual course of gestation they could not be begotten by him. But this being a matter of some uncertainty, the law is not exact to a few days."

By the Code Napoléon, the duration of pregnancy is fixed at three hundred days; by the Scotch law, ten solar months is fixed as the longest duration of the condition; by the Prussian law, 302 days; by the Roman law, ten lunar months.

Some cases of undoubted prolonged gestation have occurred, but they are by no means numerous; indeed, many of the cases recorded as such cannot be accepted, for the evidence in their favour is too imperfect. At the same time, there are undisputed instances of cases in which pregnancy lasted 290, 300, and even 317 days—that is, a period of ten, twenty, and even thirty-seven days beyond the usual forty weeks.

Some authors state that pregnancy may last a year, or even two or three. The Chinese say that pregnancy usually lasts seven or eight months, and sometimes one, two, or even four years.

In Egypt, it has been decided by the interpreters of the law that "children may remain in their mother's womb for four years. After five years, this cannot be."

On the other hand, the duration of pregnancy may be less than the traditional nine months, and the child be fully and perfectly developed. Children born at the eighth month may be of full size.

full weight, and full development. Women differ by several days in the duration of pregnancy, probably because of some peculiarity inherent in themselves. In other words, every woman has a period of gestation proper and peculiar to herself. In some cases, this period is less by three or four weeks, in others more by four or five weeks, than the generally-accepted forty weeks. Still, the great majority of women are confined in the fortieth week of pregnancy.

The time of expected confinement is often estimated from the time of quickening. This, though in some cases of a certain value, is liable to mislead greatly. When made the basis of calculation of the time of expected confinement, it is generally regarded as the middle of pregnancy. We have already pointed out, however, that quickening may occur at any time after the tenth week; and though it may happen at the end of the fourth month, yet it usually happens between the fourteenth and eighteenth weeks; and we have also said that it may not happen at all. It should, however, be called in as an auxiliary to decide the time of confinement, rather than be made the basis for the calculation. The usual method adopted by physicians is to calculate from the last day of the last menstrual flow. From that time they count 273 days, and in the week after the confinement may be expected—that is, between 273 and 280 days after the cessation of the last catamenia. Thus, suppose the catamenia ceased on the 10th of March, labour would be expected between December 8th and December 15th.

There is sometimes a difficulty in estimating the date of labour by this method, because, as we have mentioned, the menses may not have been suppressed after conception, but may have returned for two, three, or four periods afterwards. In such cases, quickening becomes of value, in order to correct any error that the appearance of the menses may have given rise to. In such cases, however, the time of expected confinement must necessarily be very uncertain, and cannot be calculated with any accuracy. Other cases, again, occur in which it becomes difficult, or even impossible, to determine the date of labour. For instance, a woman has ceased to menstruate in March—in July she becomes pregnant. In such a case, it is evident that the duration of pregnancy cannot be dated from the last appearance of the menses. Were it done, it would lead to an error of three or four months. Quickening would become valuable as an auxiliary in this case again, but by far the best method of estimating the duration of pregnancy in such cases, is to examine the abdomen carefully, and see how high the uterus reaches. In this manner, moderately accurate conclusions may be arrived at.

The annexed table will show at a glance when labour may be expected to take place in a person who has always been regular.

The dates in the first column are those of the last appearance of the menses; those in the second, 273 days, those in the third, 280 days from that date.

TABLE SHOWING THE DURATION OF PREGNANCY.

Last Day of Last Menstruation.	Time of Expected Confinement.		Last Day of Last Menstruation.	Time of Expected Confinement.	
	Earliest, 273 Days.	Latest, 280 Days.		Earliest, 273 Days.	Latest, 280 Days.
January	October	October	February	November	November
1	1	8	13	13	20
2	2	9	14	14	21
3	3	10	15	15	22
4	4	11	16	16	23
5	5	12	17	17	24
6	6	13	18	18	25
7	7	14	19	19	26
8	8	15	20	20	27
9	9	16	21	21	28
10	10	17	22	22	29
11	11	18	23	23	30
12	12	19			December
13	13	20	24	24	1
14	14	21	25	25	2
15	15	22	26	26	3
16	16	23	27	27	4
17	17	24	28	28	5
18	18	25	March		
19	19	26	1	29	6
20	20	27	2	30	7
21	21	28		December	
22	22	29	3	1	8
23	23	30	4	2	9
24	24	31	5	3	10
		November	6	4	11
25	25	1	7	5	12
26	26	2	8	6	13
27	27	3	9	7	14
28	28	4	10	8	15
29	29	5	11	9	16
30	30	6	12	10	17
31	31	7	13	11	18
February	November		14	12	19
1	1	8	15	13	20
2	2	9	16	14	21
3	3	10	17	15	22
4	4	11	18	16	23
5	5	12	19	17	24
6	6	13	20	18	25
7	7	14	21	19	26
8	8	15	22	20	27
9	9	16	23	21	28
10	10	17	24	22	29
11	11	18	25	23	30
12	12	19	26	24	31

TABLE SHOWING THE DURATION OF PREGNANCY (*continued*).

Last Day of Last Menstruation.	Time of Expected Confinement.		Last Day of Last Menstruation.	Time of Expected Confinement.	
	Earliest, 273 Days.	Latest, 280 Days.		Earliest, 273 Days.	Latest, 280 Days.
March	December	January	May	February	February
27	25	1	12	9	16
28	26	2	13	10	17
29	27	3	14	11	18
30	28	4	15	12	19
31	29	5	16	13	20
April			17	14	21
1	30	6	18	15	22
2	31	7	19	16	23
	January		20	17	24
3	1	8	21	18	25
4	2	9	22	19	26
5	3	10	23	20	27
6	4	11	24	21	28
7	5	12			March
8	6	13	25	22	1
9	7	14	26	23	2
10	8	15	27	24	3
11	9	16	28	25	4
12	10	17	29	26	5
13	11	18	30	27	6
14	12	19	31	28	7
15	13	20	June	March	
16	14	21	1	1	8
17	15	22	2	2	9
18	16	23	3	3	10
19	17	24	4	4	11
20	18	25	5	5	12
21	19	26	6	6	13
22	20	27	7	7	14
23	21	28	8	8	15
24	22	29	9	9	16
25	23	30	10	10	17
26	24	31	11	11	18
		February	12	12	19
27	25	1	13	13	20
28	26	2	14	14	21
29	27	3	15	15	22
30	28	4	16	16	23
May			17	17	24
1	29	5	18	18	25
2	30	6	19	19	26
3	31	7	20	20	27
	February		21	21	28
4	1	8	22	22	29
5	2	9	23	23	30
6	3	10	24	24	31
7	4	11			April
8	5	12	25	25	1
9	6	13	26	26	2
10	7	14	27	27	3
11	8	15	28	28	4

TABLE SHOWING THE DURATION OF PREGNANCY (*continued*).

Last Day of Last Menstruation.	Time of Expected Confinement.		Last Day of Last Menstruation.	Time of Expected Confinement.	
	Earliest, 273 Days.	Latest, 280 Days.		Earliest, 273 Days.	Latest, 280 Days.
June	March	April	August	May	May
29	29	5	15	15	22
30	30	6	16	16	23
July			17	17	24
1	31	7	18	18	25
	April		19	19	26
2	1	8	20	20	27
3	2	9	21	21	28
4	3	10	22	22	29
5	4	11	23	23	30
6	5	12	24	24	31
7	6	13			June
8	7	14	25	25	1
9	8	15	26	26	2
10	9	16	27	27	3
11	10	17	28	28	4
12	11	18	29	29	5
13	12	19	30	30	6
14	13	20	31	31	7
15	14	21			
16	15	22	September	June	
17	16	23	1	1	8
18	17	24	2	2	9
19	18	25	3	3	10
20	19	26	4	4	11
21	20	27	5	5	12
22	21	28	6	6	13
23	22	29	7	7	14
24	23	30	8	8	15
		May	9	9	16
25	24	1	10	10	17
26	25	2	11	11	18
27	26	3	12	12	19
28	27	4	13	13	20
29	28	5	14	14	21
30	29	6	15	15	22
31	30	7	16	16	23
August	May		17	17	24
1	1	8	18	18	25
2	2	9	19	19	26
3	3	10	20	20	27
4	4	11	21	21	28
5	5	12	22	22	29
6	6	13	23	23	30
7	7	14			July
8	8	15	24	24	1
9	9	16	25	25	2
10	10	17	26	26	3
11	11	18	27	27	4
12	12	19	28	28	5
13	13	20	29	29	6
14	14	21	30	30	7

TABLE SHOWING THE DURATION OF PREGNANCY (*continued.*)

Last Day of Last Menstruation.	Time of Expected Confinement.		Last Day of Last Menstruation.	Time of Expected Confinement.	
	Earliest, 273 Days.	Latest, 280 Days.		Earliest, 273 Days.	Latest, 280 Days.
October	July	July	November	August	August
1	1	8	17	17	24
2	2	9	18	18	25
3	3	10	19	19	26
4	4	11	20	20	27
5	5	12	21	21	28
6	6	13	22	22	29
7	7	14	23	23	30
8	8	15	24	24	31
9	9	16			September
10	10	17	25	25	1
11	11	18	26	26	2
12	12	19	27	27	3
13	13	20	28	28	4
14	14	21	29	29	5
15	15	22	30	30	6
16	16	23	December		
17	17	24	1	31	7
18	18	25		September	
19	19	26	2	1	8
20	20	27	3	2	9
21	21	28	4	3	10
22	22	29	5	4	11
23	23	30	6	5	12
24	24	31	7	6	13
		August	8	7	14
25	25	1	9	8	15
26	26	2	10	9	16
27	27	3	11	10	17
28	28	4	12	11	18
29	29	5	13	12	19
30	30	6	14	13	20
31	31	7	15	14	21
November	August		16	15	22
1	1	8	17	16	23
2	2	9	18	17	24
3	3	10	19	18	25
4	4	11	20	19	26
5	5	12	21	20	27
6	6	13	22	21	28
7	7	14	23	22	29
8	8	15		23	30
9	9	16	24		October
10	10	17	25	24	1
11	11	18	26	25	2
12	12	19	27	26	3
13	13	20	28	27	4
14	14	21	29	28	5
15	15	22	30	29	6
16	16	23	31	30	7

CHAPTER XII.

THE DISORDERS OF PREGNANCY.

Vomiting—Increased Secretion of Saliva—Enlargement of the veins of the Legs—Piles—Urinary Troubles—Flooding.

WHEN enumerating the signs of pregnancy we spoke of the sympathy between other organs and the uterus; and although this is almost at all times manifested, yet it is peculiarly marked when conception has taken place. To this peculiar relation is due many of the disorders of pregnancy, though others arise from the pressure exercised by the enlarged uterus.

One of the first symptoms following conception is *vomiting and nausea*. This is present at some time in almost all pregnancies. It is due to the sympathy between the stomach and the uterus. Being present in nearly every case of gestation, morning sickness may be regarded as a natural condition; yet, in some cases, the sickness and nausea are so excessive as to endanger the life of the patient, and in such cases they cannot be regarded as normal, but as morbid. It is generally believed that women suffer more from sickness during their first than during their other pregnancies. It is also said to be worse when the fœtus is a male than when it is a female. Normally the sickness is limited to the morning; it is most common on getting out of bed in the morning. The vomited matter is watery, acid, sometimes bile, and mucus. The appetite is not lost, and the patient makes a hearty breakfast.

In cases where the sickness assumes the character of disease, the stomach refuses everything. No food of any kind is retained. This may go on for weeks, and then cease suddenly; or it may go on for months and exhaust the patient's strength. The patient becomes thinner and thinner; she faints with the least exertion. The face becomes worn and anxious, and the eyes sunken. Vomiting continues even when the stomach is empty; there may be severe pains in the pit of the stomach; and unless the vomiting be controlled the patient dies. Many such cases have occurred.

The *treatment* of such cases is sometimes difficult. The vomiting may be so intractable as to defy the influence of all medicines. In most cases it can be controlled, and generally by simple means. A

cup of tea in bed, or breakfast before getting up, effectually stops it in some cases. Some will retain cold and reject hot food. Ice is of great service in all kinds of vomiting. Place bits of it in the mouth and let them melt.

The bowels should be carefully attended to. They should be made to act regularly, and never be allowed to become constipated. If the liver be sluggish, a dose of blue pill now and then will prove of use, and afterwards a black draught or a dose of castor oil. Most useful are Friedrichshall and Pullna water and Carlsbad salts, taken two or three times a week, or even every morning if necessary. Few things are of equal service with these mild purgatives. Effervescing draughts are sometimes useful. Bitters and soda, hydrocyanic acid, creosote, and salts of cerium are useful in their turn.

External applications are occasionally useful, as a small blister, mustard poultices, and turpentine stupes to the pit of the stomach. A liniment of belladonna or camphor applied to the same part in some cases proves effectual.

The patient should keep quiet—in fact, rest in the recumbent position. She should be careful what she eats—never to take anything that she knows disagrees with her, and to take the most nourishing food the stomach will retain in small quantities. If there be great exhaustion stimulants are useful; they act best in an effervescing form, as champagne, or brandy and soda and seltzer. At the same time it is better to avoid them unless they are absolutely necessary.

Should the vomiting resist all treatment, and the stomach reject everything, it becomes necessary to keep up the strength of the exhausted and feeble patient by means of injections of food into the bowel—by nutritive clysters. These should consist of beef tea. About two ounces should be administered each time. If necessary, a little brandy should be added each time. It may be repeated every four hours.

Cod-liver oil or olive oil may also be rubbed into the skin, with a view to keep up the strength by cutaneous absorption. But the vomiting may go on to such a degree as to excite the uterus to contract and expel its contents. Abortion or premature labour then occurs.

This gives a clue to a method of treatment in severe and intractable cases. Nature is a great teacher, a great saver as well as a great destroyer. In this case nature destroys the child and saves the mother; the child's life is sacrificed, and the mother's spared; and seeing this we learn to imitate it. The cases in which such extreme measures are called for are of extreme rarity. It happens only when the mother's life is in imminent and urgent peril; then it becomes a duty to act

promptly and empty the uterus, and thus save the only life that can be saved, unless, indeed, it be in the later months of pregnancy, when both lives—the mother's and the child's—can in this manner be spared. Repulsive as it is to destroy the child, still it is the highest duty, and no hesitation should be felt in sacrificing it in the circumstances stated, for unless this be done, and done promptly, not only the life of the child, but that of the mother will also be lost. We say this because women have died from the effects of vomiting during pregnancy, and numerous cases have occurred in which the vomiting has ceased as soon as the womb has been emptied. At the same time the greatest precautions should be observed before this last step is taken, for some women have recovered from the greatest danger when it was thought it had been impossible for them to survive. That such cases have perfectly recovered should not be lost sight of, and abortion should not be induced until the peril is imminent.

Some women are better when pregnant than at any other time. They eat better, grow fatter and stronger. Others, again, lose their appetite, though there is no excessive vomiting; others have depraved tastes, desiring indigestible and injurious food. Some suffer pain in the pit of the stomach, especially when food is taken; others have water-brash and acidity or heartburn. All these symptoms point to the intimate sympathy between the stomach and the uterus, and warn the future mother to be careful of her diet. She should avoid foods that are likely to turn acid, as those which contain much sugar, and those which are likely to generate gas, as well as all indigestible and in-nutritious substances. Effervescing draughts of soda and lime-juice or citric acid relieve the heartburn temporarily; in other cases acidulated bitter draughts, as the dilute hydrochloric acid and calumba, with an occasional dose of blue pill, cure it permanently.

SALIVATION, OR AN INCREASE IN THE SECRETION OF SALIVA.—

There is, probably, in all cases of pregnancy an increase of salivary secretion, but this does not become apparent. In some cases, however, it becomes a very troublesome symptom. The saliva is constantly running out at the corners of the mouth, and may amount in twenty-four hours to two or three pints. It occurs usually at an early period, and lasts for three or four months, but sometimes during the whole period of pregnancy. The mouth looks healthy, but the salivary glands are somewhat enlarged.

The *treatment* should be general as well as local. The bowels, which are usually constipated, should be acted upon freely. A wash for the mouth, containing borax or chlorate of potash, sometimes proves useful. Small blisters behind the ears, or at the back of the neck,

sometimes relieve. In the majority of cases the trouble ceases of itself; in some instances, however, it resists all treatment, lasting until pregnancy is over.

Constipation is a condition frequently accompanying pregnancy, and when allowed to go on for a long time it may prove troublesome and serious in its results. Should the constipation come on suddenly, and be followed within a short time by violent sickness, rupture should be looked for. Such a condition is of a most grave character, and requires very careful treatment. Purgatives should be avoided, and the bowels quieted. The rupture should be reduced; and, should this be impossible, an operation should be performed for its relief. Unless the bowel be returned by means of manipulation or operation, death is certain.

In simple constipation, the diet should be carefully regulated, with a view to regulate the bowels; fruit, vegetables, etc., should be taken. As an aperient when required, Friedrichshall or Pullna water, manna, citrate of magnesia, or castor oil are the most useful. Clysters of soap and water are frequently recommended, and are of great use in some cases; but for regulating the bowels, we know of nothing better than the mineral waters above named.

Occasionally, diarrhœa occurs during pregnancy. When slight, it should not be interfered with, but treated simply by diet. The patient should avoid fruit and vegetable diet, and take milk, eggs, rice, etc. Should it become troublesome, a little bismuth generally stops it.

ENLARGED VEINS (VARICOSE VEINS).—Enlargement of the veins of the legs is a very frequent occurrence towards the end of pregnancy. It appears in a first, and becomes worse with every succeeding pregnancy. It is accompanied by much pain of an aching character. The veins become sometimes very large, and appear like huge cords—almost like ropes standing out above the surrounding surface—hard and tender. The skin and tissues around them become red and inflamed. The redness is of an angry dusky hue. The whole neighbouring tissue becomes hard and resistant. The inflammation may go on to ulceration, or a vein may burst, and profuse hæmorrhage follow.

The *treatment* consists in regulating the bowels, and the application of a bandage over the whole limb, or of an elastic stocking. Rest in the recumbent posture is imperative. Should a vein burst, the bleeding should be stopped by pressure on the lower side of the opening, as the blood in the veins flows upwards towards the heart.

Piles (hæmorrhoids) are exceedingly common during pregnancy. They are due to constipation, or to the pressure of the womb on the vessels above. They consist of little swellings around the opening of

the bowels, projecting out of it. They cause but little pain at first, though they are irritable; but when they are inflamed or constricted after a straining at stool, they give rise to the most exquisite agony. They sometimes bleed profusely, after which considerable relief is obtained.

The *treatment* of piles is that of the bowels. Gentle laxatives to prevent constipation—castor oil, confection of senna, with a little cream of tartar, sulphur, or confection of sulphur. Strict cleanliness should be observed. The part should be often sponged with cold or tepid water, and an ointment of gallic acid applied. When inflamed the patient should rest, and the part be fomented with an infusion of poppy-heads; or a leech or two may be applied to the neighbouring part. When strangulated, the part should be pushed back into the bowel when that becomes possible. Frequent bathing with hot anodyne solutions, so as to deaden the sensibility, will hasten the possibility of this operation.

Neuralgia of the face is sometimes very troublesome and severe during pregnancy. It may last during the whole of pregnancy, or be limited to the earlier months. It is due sometimes to bad teeth; at other times no discoverable cause can be found. Should there be bad teeth, they should be removed; but if there be any reason why this operation be deferred, sedatives should be taken to relieve the suffering. These are powerful medicines, and should be taken only by medical advice. Together with sedatives, tonics should be taken; quinine and iron and bark are the best. During the whole of the time the bowels should be kept open.

Urinary troubles are very common during pregnancy. There may exist from the commencement to the end of that state, a constant desire to pass water, or an involuntary escape of urine. The former occurs during the early, the latter more often during the later, months. In the first case the trouble is due to irritation, in the second to pressure of the large womb upon the bladder.

In the first class of cases the diet should be regulated, malt or spirituous liquors be entirely avoided; and a few doses of a mild sedative, as extract of henbane (gr. ii.), be taken occasionally; fomentations are said to be useful.

In the second class, patience must be exercised until pregnancy is over. No local applications or medicines will relieve the condition. Strict cleanliness, however, should be observed. The parts should be frequently sponged with warm water. The thighs and private parts should be well oiled or smeared with zinc ointment, or covered or coated with flexible collodion, to prevent inflammation and excoriation. The bladder should be emptied frequently.

Sometimes, however, there is inability to pass water. In some cases this is very troublesome, and by no means free from danger. The

womb presses against the neck of the bladder, and obstructs the outlet. Urine is not passed for many hours, and the bladder becomes much distended; the distention continuing, a little involuntary dribbling occurs. The woman thinks the bladder is emptied, when in reality the distension is increasing. The cause of this is usually a displacement of the womb. It is a condition which demands immediate treatment.

Dropsy is usually seen towards the end of pregnancy, though occasionally much earlier. It is generally limited to the feet and ankles, or at most to the lower limbs. Rarely, however, it is general, affecting the whole body; the upper and lower limbs, the face, the back, and abdomen being swollen. In some cases it is very slight, and requires careful observation to detect it, even in depending parts, as around the ankles; while in others the whole body is greatly swollen. When it is limited to the lower extremities it is due to pressure caused by the enlarged womb. After the womb has ascended out of the pelvis, it, as it grows, displaces the intestines and the bladder, and presses upon the parts around. In this way the blood-vessels, as they pass through the cavity of the abdomen, become the subject of pressure. The course of the circulating fluid in them is obstructed; the blood in its course from the lower limbs to the heart is impeded, and consequently the feet and ankles become congested, swollen, dropsical. As pregnancy advances this swelling increases, and the legs may attain before labour an enormous size. As soon as labour is over the obstruction is removed, the current of the blood is restored, and the swelling gradually disappears. This form of dropsy is not attended with danger. Another form is that due to disease of the kidneys, or to a poisoned state of the mother's blood. When the kidneys are diseased, and perform their functions imperfectly, certain effete products are apt to accumulate in the blood, giving rise to blood-poison. During pregnancy this condition may arise, though the kidneys be apparently healthy. The first sign of this state of blood is to be found in the urine. It contains a substance called albumen, which is a part of the fluid of the blood, and of a highly nutritive character, and the filtration of this substance through the kidneys, and its loss by the urine, has a tendency to weaken and enfeeble the system. How pregnancy gives rise to this condition it is difficult to ascertain, and there is some difference of opinion with regard to this point. Some think it is due to pressure of the enlarged womb upon the blood-vessels of the kidneys causing stagnation of the vital fluid in them, as in the vessels of the lower limbs. Others believe that it is owing to poisoning of the mother's blood through the effete products of the child. In whatever manner it is brought about, it is a condition associated with some danger, and should not be for a moment neglected. Whenever the

least swelling of the face is observed, medical advice should at once be sought. Besides the inconvenience and discomfort arising from the dropsy itself, certain symptoms, sometimes of a severe character, arise from this state of blood, the most alarming of which are convulsions. These come on in fits or paroxysms. They may come on during the later months of pregnancy, or in the course of labour. They are always associated with danger to the mother, and prove in the majority of cases fatal to the child. The whole body may be affected by them, or only one side. They are accompanied by loss of consciousness, difficulty of breathing, and lividity of face. One fit only may occur, or a series of fits, and as soon as the patient is out of one she may pass into another. They are often preceded by headache, giddiness, nausea and sickness, shivering, noises in the head, depression, lassitude, and weakness of the limbs. These symptoms should always prove a warning, and should attract the pregnant woman's attention to her state of health.

The *treatment* of such convulsions when they set in is to inhale chloroform. This has proved a most valuable remedy in the fit and against their return. It is administered during the fits in order to cut them short, and at intervals with a view to prevent them. Chloroform is a very safe anæsthetic in pregnant women and during labour, but it should be administered by a person skilled in its use only. At the same time benzoic acid or lemon-juice is given to prevent the formation of an alkaline salt in the blood, which is believed to be due to decomposition of the blood-poison, and to give rise to the fits of convulsions. The bowels should be kept freely open by injections or by purgative medicines, such as jalap, calomel, etc.

During such convulsions labour sometimes comes on, and it should be completed as soon as possible. It may be necessary to accomplish this by artificial help, as turning or the use of instruments, for it has been frequently observed that as soon as the womb is emptied the convulsions cease. This does not happen in all, but in almost two-thirds of the cases. When there are reasons for believing the child to be dead, labour is usually brought on, for the retention of a dead child in the womb is unfavourable to the mother. In some cases the convulsions cease as soon as the womb is emptied, while in others they cease gradually; they become less and less severe until they disappear entirely.

DISPLACEMENTS OF THE WOMB.—The displacements of the womb which are met with during pregnancy are similar to those which are seen in the non-pregnant; and it is probable that the large majority of cases of displacement of the pregnant womb are due to conception

taking place in an already displaced womb. It is invariably true of that form of displacement known as falling or prolapsus of the womb, though not of the displacements known as falling backward (retroversion) and falling forward (anteversion).

Falling of the pregnant womb (prolapsus) is the least common of the three forms, and is indeed very rare. During the early weeks of pregnancy the womb is lower than usual in the pelvis, and where the parts have been repeatedly dilated and relaxed by several pregnancies and labours, it is not surprising that in women who have had many children the womb is very low. At the same time it is not often that the womb is so low down as to constitute disease, or to give such trouble that women have occasion to seek advice for it. Sometimes, however, the womb is so low down that its mouth occupies the orifice of the vagina, and, indeed, some cases are recorded where the womb was entirely outside the pelvis. Such cases are of a grave and serious character, but fortunately exceedingly rare. When the womb occupies the pelvis—though lower than natural—it rises about the fourth month, as the organ enlarges, out of the pelvis into the cavity of the abdomen. In this manner the morbid condition is cured. When, however, it is outside the pelvis, great care and management are demanded. Unless it be properly replaced during the early months, reposition will become impossible, and the womb will remain outside until labour is over. Such a condition is attended with very serious risk, and advice should be sought with regard to it at the earliest moment. In simple cases the treatment consists in lying down. In some cases, especially about the third and fourth months, lying on the face is advantageous, for it favours the ascent of the womb into the abdominal cavity. When the womb is outside it should be replaced by gentle means; and the woman should maintain the recumbent position, and wear a T bandage.

Falling backwards (retroversion and retroflexion) of the womb is the most frequent and by far the most troublesome of the displacements of the pregnant organ. The organ falls backward in such a manner as to press on the bowel behind and on the bladder in front. It has been said already that, as a rule, this condition is due to the occurrence of conception in an already displaced womb. This is unquestionably true with regard to the majority of cases, but it is probable that some cases are brought about gradually or suddenly by falls, efforts, lifting weights, straining, and other muscular exertion. The trouble begins usually about the third month, when the womb has attained a size sufficient to fill the pelvis. It is then that the effects of pressure become felt, and obstruction to the evacuation of the bowels and of the bladder is caused. The bladder is not

completely obstructed at once, for urine may be passed ; but some is always retained, and the organ is never properly emptied. The retained portion becomes decomposed, smells offensively, causes inflammation and ulceration on the inner surface of the bladder ; the bladder may become immensely distended, and at last burst, and then the urine flows into the cavity of the belly, causing inflammation and death.

Women may overlook the fact of great distension of the bladder from the fact that urine is constantly dribbling away from them involuntarily, but this is not an uncommon occurrence when over-distension and paralysis of the bladder are present. In all such cases a careful examination of the abdomen is necessary to discover the condition present, and it may be necessary to pass a catheter to draw the water with the same object. There is also constant desire to go to stool, and often inability to pass a motion. The abdomen grows bigger, and a glance at it shows an educated eye the distended bladder. It is, however, not possible to make out the exact condition of the womb, which lies at the bottom of all the trouble, without an examination of that organ through the vagina. After such examination there is no difficulty in pronouncing upon the nature of the case.

Retroversion of the pregnant uterus is a grave condition, especially if not attended to early. The earliest symptoms indicating such a condition should draw attention, and the cause be carefully investigated. Moreover, in its early stage the condition may easily be removed, while later on it is not possible to do so, or if it be accomplished it is by emptying the womb—a course to be taken only when all others have failed.

The *treatment* consists first in emptying the bladder. A catheter should be passed, and the urine drawn away. Then clysters of soap and water should be administered so as to empty the whole of the larger bowel. Having done this, the woman should lie on her face, and the uterus will in some cases ascend spontaneously ; but this happens rarely, and it becomes necessary to lift the body of the womb so as to help it out of the pelvis. This is a very delicate operation, and requires a skilled hand. Sometimes all attempts at reducing the displacement fail, the body of the uterus being too large, or having become bound down by adhesions to the neighbouring tissues of the pelvis. Under these circumstances it is necessary to reduce the size of the uterus, or to empty the organ.

Death has occurred in some cases, and in some cases even after reduction has been effected, or after abortion has been procured. Hence the urgent need of early attention in all cases where there is retention of or difficulty in passing urine.

There are two or three cases on record in which a woman with a womb fallen back (retroversion) has gone to the full term of pregnancy, and after very prolonged labour has been delivered. Such, however, is not the usual termination; it is abortion and recovery, or death from inflammation and blood-poisoning.

Falling of the womb forward (anteversion) is the usual condition after the second month. By assuming this position the organ rises into the cavity of the abdomen. The treatment consists in rest on the back.

Discharges of a watery or of a thick yellowish fluid from the vagina are exceedingly common during pregnancy. It sometimes causes much discomfort, a burning, tingling, or constant itching about the private parts.

It should be treated by observing strict cleanliness, a tepid bath twice daily, regulated diet, and total abstinence from stimulants. The bowels should be regulated by mineral waters or sulphur, confection of senna, etc. After the use of the tepid bath an injection consisting of Goulard water or a weak solution of acetate of lead should be used; the parts should then be carefully dried with a soft cloth. If there be general weakness, steel or acids and bitters will prove useful.

Discharge of blood during pregnancy is almost invariably a serious symptom. As a general rule, it may be said that with the exception of those cases in which menstruation takes place for a few times during the early months of pregnancy, hæmorrhage from the pregnant womb is not unaccompanied by danger; there are a few cases in which disease of the womb itself gives rise to bleeding during pregnancy. These cases are not of very common occurrence, and we will confine our remarks in this place to flooding arising from something unnatural in the pregnancy itself.

Flooding, then, is frequently the first signal of abortion. This may occur at any period of pregnancy. Threatened abortion may often be warded off, and the woman recovers and goes to her full time. Abortion is the result of disease or of accidents. Very slight accidents will give rise to it in some women; and women who have aborted once or twice get into a habit of doing so, and it is difficult to make pregnancy proceed to the full term in them.

Later on, during the later months of pregnancy, flooding of this kind is called accidental hæmorrhage. It is due to partial separation of the afterbirth from the womb, and often causes premature labour. It is caused by accidents, as falls, blows, fright, etc., and by disease of the afterbirth.

Another form of flooding is what is called "unavoidable hæmorrhage." No accident produces this. Its occurrence is a matter of necessity after the fifth or sixth month of pregnancy. It occurs oftener in women

who have had several children than in those who are pregnant for the first time. It is due to the fact that the afterbirth is misplaced (so to speak), for it is situated over the neck of the womb instead of being attached to the upper part of the body of the organ.

All cases of hæmorrhage during pregnancy are of a very serious character, and they tax to the highest the skill of the most expert. Medicines and plugging are of but little use. Absolute rest in bed is essential; cold may be used, and in some cases anodyne may be given, but only in cases where the patient can be frequently seen by the doctor—and every case of flooding should be frequently seen. Should the hæmorrhage continue, labour should be brought on, and the womb quickly emptied.

It is evident that pregnancy is a state which is attended with no little anxiety; and that the woman who is pregnant should be the object of earnest solicitude and kind attention.

The numerous sympathies manifested at this time between other organs and the uterus—as the breasts, stomach, kidneys, nerves—when moderate in degree, are normal, yet even then they are a source of trouble and discomfort. But when they obtain a morbid degree, what terrible inflictions they become! Towards the end of pregnancy still greater claims has woman upon our tenderness, for then she is often a burden to herself. It should never be forgotten that pregnancy gives rise to alterations in disposition, and increases the general susceptibility; that it sometimes makes the most amiable irritable, the self-denying indulgent, and the cheerful despondent. “The respectful deference which is commonly shown to women in civilised countries at all times is now therefore more especially demanded; while a little forbearance and feeble persuasion will do much more than rudeness or harshness in making the future mother conceal any infirmity of temper, as well as in enabling her to preserve a calm and cheerful deportment.”

CHAPTER XIII.

MISCARRIAGE OR ABORTION—CAUSES OF—SYMPTOMS OF.

BY abortion is meant expulsion of the embryo from the womb before the seventh month of pregnancy; when it takes place between this period and the ninth month it is called premature labour. Both are of very frequent occurrence. When expelled before the end of the seventh, the embryo, or child, is already dead, or dies soon after birth; when after, it may live and be reared. Abortion is said to take place more frequently in first pregnancies than in later ones, for what reason it is difficult to find out. On the other hand, there is some evidence to show it occurs more frequently in later pregnancies, and in conceptions occurring about the “dodging-time.” A pregnancy about this period is an anxious time to the subject of it.

The causes of abortion are very numerous. They may be divided into diseases affecting the mother’s health, diseases of the embryo, and accidental causes.

DISEASES OF THE MOTHER.—Acute disease and fevers, as inflammation of the lungs, typhoid or scarlet fever, or small-pox, not uncommonly give rise to abortion. Though this is the general rule, yet it is by no means without exception, for women pass through severe attacks of acute fevers and go to their full time—pregnancy not having been in any way interrupted.

Constipation, either from natural inaction of the bowels, or from pressure upon them of the pregnant womb, gives rise during the early months of pregnancy to such violent straining as to induce the womb to expel its contents. The presence of hard masses of fæces in the intestine alone is often enough to irritate the womb, and excite it to contraction, which may end in miscarriage.

Skin diseases are occasionally the cause of abortion, especially when they give rise to great and intolerable irritation.

Inflammation of the uterus itself, and of the tissues around it, sometimes causes miscarriage. In this case the womb is bound down in the pelvis by firm bands. As pregnancy proceeds, the uterus becomes larger and softer; the tissues around participate more or less in the changes which the womb passes through, and becomes more yielding and soft; but in some cases they possess too great a

resistance to permit the womb to rise and escape into the cavity of the abdomen when it has become too large to be contained in the pelvis. Unless they give way, or yield, abortion will take place; but on the other hand, should the womb be permitted to escape into the cavity of the abdomen, pregnancy will go on uninterruptedly.

Displacement of the womb is another cause of this trouble. These affections have already been described. The danger of abortion arising from them is about the third or fourth month, when the womb goes up into the abdominal cavity from the pelvis. It is true that they frequently give rise to many troubles before this time, and that they have given long warning of their presence, yet it is now that they put forth all their strength that the troubles which they cause reach their highest danger. These displacements may have existed previous to conception, or they may have been brought on since.

Retroflexion does not absolutely prevent conception, and the pregnant uterus may also be retroverted during the early months of pregnancy by the straining which often occurs when the bowels are obstinately constipated. When this happens, there is a sudden severe pain in the abdomen; the neck of the bladder becomes pressed upon; and as the womb grows the urinary passage becomes quite obstructed, so that there is complete retention of urine with all its evils. The womb occupying the abnormal position becomes greatly congested, increases in size, presses against the walls of the pelvis, and being unable to escape into the cavity of the abdomen, contracts upon its contents and expels them.

Falling down of the womb rarely gives rise to abortion, but falling forward is said to cause it very frequently, considering the rarity with which the anteverted womb becomes impregnated.

Fibroid tumours of the uterus, ovarian tumours, or other tumours of the abdomen or of the pelvis; disease of the lungs, liver, heart, and kidneys; convulsions, whether they be hysterical or epileptic in character, a nervous temperament, or full-bloodedness (plethora); lead-poison or blood-poison of any kind may cause miscarriage.

Diseases of the Embryo which produce abortion.—The unborn infant is liable to disease just as the newly-born is. At any period of pregnancy it may become the subject of disease, and it may perish in consequence or live to the full time. Diseases are hereditary, just as well as facial and bodily lineaments; and the diseases of the father and mother may be transmitted to the child, and while still in the womb it may show signs of them. During the early months the intestines and liver are apt to suffer; later the brain, the glands, the lungs, the chest, heart, blood-vessels, and abdomen.

During the later months of pregnancy the unborn child may suffer

from almost any disease which the newly-born may be subject to. If the mother suffer from acute fever, cholera, consumption, or scrofula, the child may suffer from the same. Children have been born with measles or scarlet-fever rash upon them.

The after-birth is also subject to disease, which may destroy the child and produce abortion; or it may become partially separated from the womb, which, as a rule, results in flooding, and ultimately in miscarriage.

When the child dies in the womb, it is not, as a rule, expelled at once, but is retained for several days—from six to twenty. During this time there is some uneasiness, and perhaps signs of threatening abortion, and it is important to know whether the child is alive or dead. If the child is dead, the mother does not longer feel its movements; she does not increase in size, but there is a sense of coldness in the belly—a heaviness in the bottom of the abdomen; the breasts do not grow—lose their roundness and firmness, and they become loose and flaccid. If there be a fetid discharge it is almost certain the child is dead. It is exceedingly difficult to make sure of the death of a child in the womb, because the distinctive signs of life, as the sounds of the heart, may be missed, though the child be alive; and when the child is dead all the above symptoms may be absent.

False conceptions, as the flesh and grape mole, have been described, and we need not do more here than refer to them as causes of abortion.

ACCIDENTS.—The most common are violent bodily or mental shocks, fright or grief, fatigue, blows, falls, riding, jolting, driving, dancing, violent diarrhœa. It is surprising how little is enough to cause abortion in some women, and how difficult it is to get the womb to expel its contents in others. Severe injuries, heavy falls, violent attempts even at destroying the fruit, have in many cases completely failed to excite the organ to act. There is hardly an injury compatible with life—danger however great, excitement however powerful—which pregnant women have not suffered without evil effects.

It is said that some women acquire the habit of aborting. By this is meant that if a woman aborts once or twice she is very likely to do so again. In these cases there is something more than habit, and if the womb be carefully examined it will be found that it is in an unhealthy condition. It may be that it has not had time to recover from the first pregnancy and labour before the second conception takes place; the organ may be inflamed or ulcerated; in any case, however, some condition is present which is unfavourable to healthy pregnancy.

SYMPTOMS.—The symptoms of abortion during the later months are similar to those of labour; at an earlier period they depend upon the degree of development which the embryo has attained. If it occurs a week or a fortnight after the first absent period was due they will be little more than those of menstruation—a little more discharge, a few clots, and a little pain. The symptoms vary in severity between these extremes. We stated elsewhere that a periodical discharge of blood occasionally takes place during pregnancy: this should not be mistaken for the commencement of abortion. It is true that abortion frequently begins with flooding, but there is usually also pain in the abdomen. On the other hand, there is no pain in the former case, and the discharge is not profuse. Whenever bleeding occurs during pregnancy—whatever be its cause—the woman should rest in bed.

Women are apt to treat a miscarriage as if it were a matter of little or no importance; they frequently walk about, follow their occupation, and do their work during the whole time. Now it should be known, that though a miscarriage may be associated with little danger when properly attended to, yet when treated without due care and attention it may not only lead to endless troubles, and lay the seeds of many diseases, but may even prove fatal.

Whenever miscarriage is threatened, when bleeding sets in, all the discharges should be carefully kept—no clots or substances should on any account be thrown away; they should all be preserved until the visit of the doctor. They should be shown to him, for from them alone he can form an opinion whether “everything has come away” or not.

Unfortunately, women constantly act in the very reverse way: as soon as anything is passed it is carefully thrown away so that it cannot be seen again; it can safely be said that by so doing they do their best to prevent the doctor doing his best. By the examination of the substances passed, if they were all preserved, the medical man could easily say if there was any more to come away, and in this way decide what measures are needed.

The risk of leaving a portion of the after-birth behind in abortion is even greater than after labour. In the latter case, the danger is slight: it occurs daily, and usually the contractions of the womb are alone enough to expel it. In abortion, however, the contractions of the womb are feeble; the after-birth has not undergone the preparatory process for separation; it is firmly attached, and not easy of removal. After everything has come away a time of rest is required for the womb to return to its ordinary condition, just as it is necessary after labour. Absolute rest should be observed until all red discharge has stopped and for some time after. The observation of this counsel alone will

save much future suffering; for there is nothing more productive of uterine diseases than carelessness during abortion.

At this time the diet should be good, but plain—meat, vegetables, bread, milk, and beef tea. Stimulants are not, as a rule, necessary. If there has been great loss of blood, however, they may be urgently needed. The bowels should be regulated. The breasts give no trouble for little or no milk will appear in them

CHAPTER XIV.

THE MANAGEMENT OF PREGNANCY.

Food—Clothing—Baths—Exercise—Sleep.

WHEN a woman has conceived, her chief object and desire is and should be a healthy pregnancy and a safe labour. With this object in view, she should be watchful over everything that can affect or influence her physical, mental, and moral health and development; on this depends not only her own but her offspring's health. The food should, during pregnancy, be plain, and in sufficient quantity. Sometimes, as has been already stated, the appetite is lost or becomes degraded after conception, and there is a desire not simply for innutritious but for positively injurious substances. Now, the fancies of pregnant women should, as far as possible, be gratified; but there is a limit beyond which complaisance should not go: that limit is reached when injurious substances are desired as food. They should be refused, however painful it would be to do so. At the same time, great latitude should be allowed, because food which is indigestible is sometimes digested, in others vomited. The food, then, should be plain, nourishing, and abundant—meat twice a day, bread, vegetables, milk, and fruit pudding, unless the latter disagree.

Stimulants under ordinary circumstances are unnecessary; at least, no increase should be made on account of the conception. If the patient be accustomed to take small quantities of ale, claret, or wine, she may continue to take them to the same amount; but when water has been the usual drink it is best that it continue so. It will have a favourable effect both on the mother and the child's health.

There may arise, however, circumstances which demand the use of stimulants, as acute disease setting in, or a profuse loss of blood, or other exhausting condition. In such cases stimulants should be taken under medical advice.

CLOTHING.—All women wear stays, and it is right that they should do so. During pregnancy they should not be left off, but should be made in such a manner as to fit to the altered figure. Some women, without reason, appear as if ashamed of a condition which they are really proud of, and attempt to conceal the fact of their pregnancy for as long a period as possible. This is effected by tight-lacing, a practice

that is most injurious to themselves and the child. It is to be deprecated and condemned, and there is no single reason in its favour. It arises entirely from a feeling of false delicacy, which a person who aspires to become a mother should not indulge in. On the other hand, stays are of great service when properly made. As pregnancy advances and the womb increases in dimensions, great pressure is brought to bear on the walls of the abdomen; the skin is stretched and cracked; the muscles and all the tissues are put on the strain; there is often severe pain in the lower part of the chest, owing to the dragging upon the ribs in the places where the muscles are inserted. A properly-made belt or stays brings considerable relief to these troubles. Such a stay should be moulded to the body, should not be stiff, should embrace the whole of the abdomen so as to give it equable support, and should have strong elastic at the sides, so that it may yield when necessary.

Flannel should be worn next the skin in summer as well as winter. It is at all times better than linen. The thickness of the material can be regulated to meet the peculiarities of the individual and the changes of the seasons. More or thicker clothing is generally required during pregnancy; than at other times, owing to the increased nervous sensibility and susceptibility to disease.

Drawers of flannel should be used; they are better when they open on the side, and with elastic below the knees. In this way perfect protection from cold and draughts is insured.

Garters should be worn as little as possible. There is great tendency during pregnancy to the distension and enlargement of the veins of the legs, owing to the pressure from the enlarged womb impeding the return of the blood from the lower limbs to the heart. Every effort should be made to relieve this, and ward off whatever has a tendency to aggravate this condition. Garters, especially when worn tightly, appear to favour the distension of the veins. It is, of course, not possible to do entirely without the aid of garters; at the same time, there are many hours of the day, or even many days, when their use can be dispensed with altogether during pregnancy; and by discarding them as much as possible, and by never wearing them tight, it is in some cases possible to save oneself infinite trouble and great pain.

BATHS.—Many, if not most, ladies nowadays take their daily sponge bath. In many cases it is cold, in others it is tepid. Both are useful, and should not be discontinued during pregnancy.

Exercise is necessary to the enjoyment of health at all times. Pregnancy is no exception to this rule; and every day she who is in the family way should take a "constitutional." Indeed, it is perhaps

more necessary during this period than at any other time. Care, however, should be taken not to overdo it. Violent exercise which calls the muscles into forcible action should be avoided, as riding, rough driving, dancing, etc. Violent efforts, as over-lifting or straining, should be avoided. Long walks, causing great fatigue, should be forbidden. Quiet driving, but, best of all, walking exercise is to be recommended: a short walk morning and evening, and a third at noon, if not too fatiguing. This favours digestion and nutrition: promotes the change of material in the body; favours circulation, which during pregnancy becomes sluggish, thereby causing enlarged veins, swollen legs, and bleeding piles.

SLEEP—The amount of sleep that different people require varies greatly. Some can do with four or five hours a night, while others can hardly do with less than eight or nine, and could even enjoy twelve. During pregnancy early hours should undoubtedly be rigidly observed in the evening; in the morning, however, a longer rest than she is accustomed to will often prove very grateful to the feelings of the future mother, and she should not be denied the indulgence. During the day she should rest several hours, and always with the feet on a level with the buttocks.

Great care should always be taken in guarding against accidents to pregnant women; not only falls, blows, and direct injuries, but also sights or news, etc., which are likely to cause a sudden shock. Repulsive objects should be kept from view. This is not because they are likely to brand the child with what are called "Mothers' Marks," but because they may produce fits or hysterical convulsions; or a sudden shock may destroy the child, or bring on miscarriage, at any period of pregnancy

CHAPTER XV.

THE MANAGEMENT OF LABOUR.

The Period immediately following—After-pains—Secretion of Milk—Excessive Secretion of Milk—Deficient Secretion of Milk—Deformed Nipples—Sore Nipples—Milk Abscess.

SOME time before labour actually sets in premonitory symptoms or warnings of it have been observed. The first of these is the falling or sinking of the womb, which takes place during the last month of pregnancy. This is almost invariably observed. Women say that the child is lower—that they do not feel so uncomfortable, so full and distended. This is because the pressure of the womb is in part removed from the chest, and there is in consequence more breathing space. Other troubles, however, appear: the bladder becomes more irritable, micturition is more frequent, and the bowel may be irritated so as to give rise to slimy or mucous diarrhœa. Walking also is performed with greater difficulty; there is a general preparation in the pelvis for the birth of the child. All the tissues become softer, and the firm joints which bind its several parts together appear to become looser and more yielding. The first symptom of real labour is pain. This is due to efforts made by the womb to expel its contents. The pain is seated at first in the abdomen, and is similar to sharp colic. Pains similar to these may come on several days—even a week or more—before labour. They sometimes return every night and cease in the day. They are then due, in the majority of instances, to some deranged condition of the stomach and bowels, as constipation, or the indigestion of indigestible food. Such a condition at all times, and especially during pregnancy, is apt to give rise to pain in the womb. A dose of castor oil or Friedrichshall water will empty the bowel and dispel the pains. When labour really sets in, the pains return at intervals. At first the pains last a very short time; they are little more than sharp twinges, with long intervals between them. The pains gradually become longer and more severe, and the intervals shorter. After a time, the pains, instead of having a colicky or twinging, assume a bearing-down character. They go to the back, and then the woman has more suffering in the loins than anywhere else. She calls the nurse to press or support the back, and this gives great relief.

As labour advances, a discharge makes its appearance from the vagina. At first it is a pale or colourless viscid mucus. The quantity

of this secretion varies: in some cases it is very profuse, while in others it is scanty. A large quantity of it is generally regarded as a sign that the labour will not be a long one. After a time, when the labour has made some progress, what is called the "show" presents itself. This is a slight discharge of blood, and indicates the advance made by the child's head. It is a sure sign that labour is progressing. About the same time the patient may feel chilly, or have a slight shiver or rigor. This is of frequent, indeed, of usual occurrence, and should be expected in the natural course of events. Another occurrence of great importance which takes place about this time is the rupture of the membranes and the escape of the waters. The amount of water which escapes varies much in different cases. The quantity may be immense, or it may be trifling. The latter condition may be due to one of two things—retention of a part of the fluid in the womb, or an originally small amount of water. With the escape of the waters the pains alter in character. Before this event the pains were of a teasing, colicky character; afterwards they become stronger, of longer duration, and of a bearing-down character. The severity of the pain varies much. Some persons suffer but little, while others suffer severely. The pains gradually increase in severity until the head is born; then there is a short interval of relief, after which the body is expelled. When the child is completely born, the nurse (if a doctor is not present) should keep her hands on the lower part of the abdomen, just above the pubes, or below the navel. Then she ought to feel a hard, round, smooth mass, like a cricket-ball or a child's head; upon this she should lay her hand flat, and hold it firmly down. It is the contracted womb, which should be maintained in a state of contraction, and not allowed to become relaxed. There is no great hurry about the child, so long as its mouth is kept out of the discharge with which it is surrounded, and is able to breathe. When the mother has been duly attended to, the child should be separated; this is called by some midwives "taking the child." The navel-string or cord should be tied in two places by means of tape or of strong thread. The first ligature should be placed about an inch and a half or two inches from the child, and the second an inch or an inch and a half beyond the first. The navel-cord should be then divided with a pair of scissors between the two ligatures. Care should be taken that the cord is the part really divided. The object of the ligatures is to prevent bleeding. The really important one is that next the child, for if it be not properly and firmly tied the infant may bleed to death. The second is of no great importance, though it is usual to put it on.

The child having been separated, the next object is the removal of the after-birth. This is usually expelled in the course of half an hour after the birth of the child by the efforts of the uterus alone; and no

attempt should be made to remove it except by one thoroughly acquainted with the method of doing it. Nurses and midwives are often greatly afraid that the cord may be drawn up into the womb, and in order to prevent such an untoward occurrence they tie it by means of the ligature-string to the patient's thigh or leg. This is a harmless practice enough; at the same time, we must say it is absolutely useless, for it is not possible for a navel-string of moderate length to be entirely drawn up into the womb; and even were such an accident to occur it would result in no harm whatever. Were this the only interference of which ignorant attendants are guilty it would be indeed well; but, unfortunately, attempts are frequently made to remove the after-birth by dragging on the navel-cord. Such attempts are exceedingly mischievous, and may lead to the gravest injury. Every now and then the cord gives way, and the after-birth is left in the womb. When this has happened, a doctor is sent for, and the removal of the organ is by no means easily accomplished. In other cases the cord does not yield, but the uterus is turned inside out by the dragging upon it. This inversion of the uterus is a most serious accident, and imperils life; indeed, it has proved in some cases immediately fatal. But pulling at the cord leads to other less serious but very troublesome consequences. It irritates the womb, excites it to irregular contractions which do not expel the after-birth, and renders it difficult for it to be removed artificially.

When waiting for the expulsion of the after-birth, it should be remembered that the navel-string should not be pulled upon; that the hand should be kept on the abdomen just above the pubes, in contact with the womb; that whenever the round tumour, like a cricket-ball, loses its hardness and firmness, and becomes soft and flabby, there is danger of bleeding; and that, in such circumstances, gentle rubbing and pressure, or kneading should be practised over the part until the womb becomes hard again.

No medicine should be given during labour, unless ordered by a doctor, nor until after the expulsion of the after-birth. After birth is completed—that is, when both the child and after-birth are born—a draught, containing a tea-spoonful of the liquid extract of ergot of rye in a little brandy and water, may be given if there be any signs of flooding. In no case should ergot be administered before the birth of the child.

The management of the lying-in room is of no little importance. When the event is expected, everything should be in readiness: the doctor should be engaged and known, and the nurse should be in the house a day or two before, if possible. The baby's clothes, napkins, binder, mackintosh, draw-sheets, and all the little things that will be necessary to make both the mother and child comfortable, should be

procured ready before the expected time. It is well to have all this done some time before the calculated time of labour, because now and then the baby arrives a fortnight or three weeks before it is expected. The lying-in room should be quiet; there should be no more than one friend, and that one a mother, if possible. The husband is better out of the room. In the room these three should be together with the patient: the doctor, the nurse, and one friend. The choice of a nurse is as important as the choice of a doctor. It is sometimes well to engage a nurse at the recommendation of the doctor in attendance; she should be intelligent, sober, wakeful, and should thoroughly understand her business; she should not be meddlesome. Of all nuisances in a lying-in room, perhaps an interfering nurse is the worst of all—both to the patient, her friend, and the doctor. She should observe the directions of the doctor accurately; observe the patient carefully, and report accordingly to the medical man in charge.

After confinement the patient is worn, tired, and exhausted. "A temporary calm follows the energetic action which issued in the delivery of the mother. After the excessive action, in which nerve and muscle seemed strained to the utmost pitch, there comes a sudden and profound repose; there is perfect freedom from pain; every fibre is relaxed; only the uterus now contracts of all the muscles which were so lately struggling. Like some ship which turns from a tempestuous sea into a safe and quiet harbour, the young mother passes from the storm of childbirth into the tranquil haven of maternity. In the pathetic words of Scripture—'A woman, when she is in travail, hath sorrow, because her hour is come; but as soon as she is delivered of the child, she remembereth no more the anguish, for joy that a man is born into the world.'"

Absolute rest is now necessary. For the first few days the new mother should see few or no friends. The room should be darkened and kept perfectly quiet, so as to favour the induction of sleep.

During the month that follows labour great and important changes take place in the lying-in patient, and everything should be done in order to favour the regular and normal performance of these changes; for upon this the future health of the woman may in a great degree depend. Moreover, slight causes may interfere with them, and may give rise to the beginnings of disease which may easily be prevented, but which is with the greatest difficulty cured when once it has lodged itself in the womb.

The chief changes which occur during this period are the involution, or the reduction of the womb from the enlarged condition in which it is immediately after labour to the normal size of the organ in its unimpregnated state; and the secretion of milk in the breasts.

In order that these processes may go on in a proper manner, there are many conditions which should be observed, which we shall mention as we proceed; and, first of all, we will speak of the food of the lying-in woman.

It was once believed, and is still too generally held, that the lying-in woman should be kept low for the first few days after labour. It was thought that she was in a condition peculiarly liable to inflammation, and that good nourishing food was likely to excite that formidable disease. This, however, cannot be maintained; insufficient food is far more likely to retard recovery, and to interfere with the normal processes going on in the body. Instead of limiting the diet to tea, arrowroot, and water-gruel, a nutritious but easily digestible and unstimulating diet should be taken: as beef tea, chicken soup, etc.; not discarding entirely, however, the old *régime*. Except in special cases, stimulants—wine, spirits, and beer—are unnecessary.

The binder should, for the first three days, be carefully adjusted. It is liable to slip up under the armpits or round the lower part of the chest, where it is of no use; when this happens, it should be taken off and replaced in the manner already described.

After labour the bowels are generally confined: this is especially the case when they had acted freely just before or during labour. In such cases it is not necessary to be anxious about them for the first two days; on the third day, however, if they still remain torpid, it is advisable to give a dose of castor oil or other mild laxative. When they have been freely acted upon, the patient may return to her ordinary diet. About this time the milk begins to form in the breasts, and the mother has to take food for herself and also for her infant. There is, consequently, an increasing demand for nourishment, and the food should be plain and good, but abundant: animal food twice a day, with vegetables and bread, and the usual amount of beer or wine.

For some days after childbirth there is a discharge of blood from the womb. At first this contains coagula or clots of blood. These disappear after the first day or two, but the sanguineous discharge lasts for seven or eight days. It is at first almost pure blood, but after the first three or four days it begins to lose its colour, becomes paler and paler until about the eighth or tenth day, when it assumes a greenish colour (then it is called the green waters), and disappears from the twelfth to the fifteenth. This discharge is passed in greater quantities during micturition, or at stool, or during after-pains. It is necessary that the discharge should be free, but not profuse. A discharge of blood sometimes continues during the whole month; then something wrong should be suspected, and should be at once attended to. While the discharge continues, napkins should be worn and changed frequently;

and at each change the parts should be carefully sponged with warm water containing one teaspoonful of tincture of iodine to the pint, or a $2\frac{1}{2}$ per cent. solution of carbolic acid, or a 1 in 3000 solution of corrosive sublimate. This is imperatively demanded, for the secretions are liable to undergo rapid decomposition. Should the discharge become offensive in the passages, it may be necessary to wash them out twice or thrice a day, by means of injections of warm water containing tincture of iodine in the proportion mentioned.

AFTER PAINS.—After the womb has expelled its contents, it remains in a more or less contracted condition. This contraction, however, varies in degree at different times. Sometimes the organ contracts more vigorously and then relaxes again. These contractions are accompanied by pain—called after-pains. Their occurrence is a natural phenomenon, and up to a certain point they have a beneficial influence, and favour the changes which take place in the womb. They are absent, or more generally slight, in first cases, and increase in severity with each successive labour, so that in a woman who has had many children they may cause much suffering. They begin soon after labour, and continue in some cases for three or four days, and may require special treatment. A warm poultice or a hot flannel over the lower part of the abdomen will frequently give relief.

They are aggravated by putting the child to the breast, by taking food, by the action of the bowels or of the bladder, or by the distension of the last named organ.

Rest is of the greatest importance in the early part of the lying-in month. The patient should remain in bed for ten or twelve days, and in some cases even longer. Then she may sit up, and rest on the couch or on the outside of the bed, but it is advisable for her not to leave her room until the third week; and she should rest for a great part of each day until the end of the month. This should be the rule; there are exceptions when still longer rest would be beneficial. Too early getting up is productive of numerous troubles; it may give rise to a profuse bleeding, or keep up a sanguineous discharge for weeks, or even months; in many cases it is the cause of sub-involution of the uterus, with all its troublesome consequences—to falling of the womb, to relaxation of the soft parts around the uterus and of the floor of the pelvis, and to other forms of displacement.

SECRETION OF MILK.—We have already stated that changes in the breasts form part of the signs of pregnancy. These changes become more marked as pregnancy advances, and attain their maximum a few days after the child is born, when the milk has become freely secreted. During

the last month of pregnancy milk is found in the breasts in small quantity, and can even be pressed out from the nipple, but the proper secretion of milk takes place in most women about the third day after labour. At this time the breasts become rapidly harder, fuller, and painful: there appears to be a rush of fluid into them; the patient feels ill, feverish, has a headache and a quick pulse. In some cases there is a slight shiver, or rigor, hot skin, a free perspiration, and there is free secretion of milk in the breasts. This is called "milk fever."

It is a question of some importance when the child should be put to the breast. Should it be put early, during the first two or three days, before the milk is fully secreted? or is it better to wait until the breasts are acting freely? There are several advantages in applying the child early. Irritation of these organs causes the womb to contract, causing it to expel clots that may be lodged in its cavity, and favours involution. It undoubtedly also favours the flow of milk into the breasts, so that in cases where milk is scanty this is one method of increasing it. It also draws out the nipple when this is flat or small; "and what is now likely to occur, should this have been omitted, is a projection of the areola which participates in the tumefaction of the rest of the gland, so that the nipple falls in, as it were, on a level with the skin, when it becomes a matter of some difficulty for the child to seize it."

After a first labour, when the milk is secreted, the child may find some difficulty in drawing it out along its fine channels; and the pain arising from it to the mother may be severe. In such a case it is advisable for the nurse, or some fit person, to draw the breast herself or by means of a breast-pump. Once the milk flows freely out of the nipple, this pain is relieved. Besides, as the child requires but little at first, the breasts are frequently but imperfectly emptied by its efforts, then gentle rubbing of the harder parts of the gland with olive oil will cause the milk to flow out, or the breast-pump may be used for the same purpose. During this period the heat in the breasts is great, and in parts they become hard and cord-like; in such cases it may be necessary to keep evaporating lotions constantly applied to them. The best is an ounce of spirits of wine to eight ounces of water. When the organs become troublesome, on account of their size and weight, they should be suspended by means of silk handkerchiefs tied over the neck.

Under these circumstances, the child must not be too frequently applied to the breasts. It is better to relieve the distended organs by completely emptying them by means of the pump, for the irritation caused by the imperfect efforts of the infant increases the troubles.

The milk first formed in the breasts is thicker than that formed when the flow is well established; it has irritating properties, and serves as a purgative to the child, acting freely on its bowels. It loses this character in the course of two or three days, and acquires the properties of the mother's natural milk.

The quantity of milk formed in the breasts of different women varies greatly. In some it is so abundant as to flow out spontaneously from time to time, while in others the breasts are absolutely dry. In the first case, the woman is said to be a good nurse; in the latter, a bad, or rather, no nurse. Besides the difference in the quantity of milk secreted, there is also considerable variation in quality met with; and, in reality, the value of anyone as a nurse depends, not on the quantity of milk secreted in the breasts only, but also upon its quality.

EXCESSIVE FORMATION OF MILK.—This gives rise occasionally to serious troubles. The milk may be of good quality, or of a watery character. When the milk is good, the child does not suffer—it thrives; but the inconvenience to the mother is not inconsiderable. The secretion is so rapid that soon after the breasts have been emptied they fill again, and suddenly pour out their secretion, keeping the mother's breasts in a perpetual state of moisture.

The breasts are so irritable that the least touch gives rise to an overflow of milk; and when the child is applied to them they pour their contents out more rapidly than the child can swallow, filling its mouth, and giving rise to a choking feeling. When this is allowed to go on for a long time, the drain affects the mother's health, and may ultimately undermine her constitution.

In such a case the chief object should be the regulation of the diet. The food should be good and plentiful; but it should be chiefly solid. The amount of fluid taken should be very limited.

DEFICIENT SECRETION OF MILK.—The secretion in the breast may be scanty or absent. The quantity varies between the extreme abundance described in the previous paragraph and none. Absence or deficiency of milk may occur in women who are perfectly healthy. It is not often seen under those circumstances, but usually in women who suffer from acute disease. It is one of the first symptoms of those diseases to which the lying-in patient is subject. The breasts in these cases become distended and full about the third day, and milk is abundantly secreted; and about the fourth or fifth day, when the disease sets in, it becomes greatly diminished or entirely suppressed. The discharge from the womb is also arrested. These two symptoms appearing together are of very serious import. On the other hand,

when there is deficiency or absence of milk in good health, the cause rests in the particular constitution of the patient, and secretion fails from the first: and in these cases the only evil that follows is the inability of the mother to nurse her child.

DEFORMED NIPPLES.—The nipples are sometimes small and flat, so that the child cannot suck. This may be due to original conformation or to the pressure of badly-made stays. This is frequently a source of trouble and annoyance. The mother has plenty of milk and is anxious to nurse her child, but experiences the greatest difficulty in doing so owing to the imperfect shape and size of the nipple. The child cannot take it into its mouth and retain it there with ease, and, consequently, bites and bruises it. To remedy this, efforts should be made to draw out the nipple. These should be tried after labour and before the milk has come into the breasts, and continued afterwards. The child may be applied; and should this prove ineffectual, the services of a sister or nurse should be obtained. If this cannot be obtained, then an attempt should be made to draw it by a pump. The following simple method answers well in some cases:—Take a soda-water bottle, or a bottle of similar shape and size; fill it with hot water; pour the water out, and apply the neck of the bottle over the nipple; as the bottle cools, the partial exhaustion formed by the condensation of steam will cause the nipple to protrude and be gradually drawn up into the neck of the bottle. When this is effected, the bottle should be retained in that position for a few minutes, and then tilted a little on one side while the breast is pressed on the opposite side so as to allow air to enter the bottle, and the nipple be withdrawn without injury.

India-rubber teats, or artificial nipples, are of great service in these cases; and they will enable any mother who has plenty of milk, and is anxious to nurse her infant, to do so, whatever be the shape of the nipple. They can be obtained at the druggist's. They should be made of the natural black india-rubber, for it is practically devoid of taste; while the white india-rubber, or caoutchouc, has a sickly and unpleasant taste and smell.

Sore Nipples are very common, and very troublesome and painful. It is often not easy to cure them, on account of the frequent application of the child to them in nursing. When cracks or fissures, and excoriations are present, every application of the infant aggravates the suffering.

They are easier of prevention than of cure. During the later months of pregnancy they should be frequently bathed with salt and water, or a weak spirit lotion, or an infusion of tea. After labour, and during the period of nursing, the same treatment should be continued. If this

proves ineffectual, a lotion of Goulard water, or, better still, glycerine tannin, should be applied after each application of the child. Extreme cleanliness is necessary under these circumstances, for the sake of both mother and child. The nipple should be bathed with warm water after each act of suckling; then carefully dried, and the application applied afterwards. This should be allowed to remain until the next act of suckling, when the nipple should again be bathed with warm water, so as to remove all trace of the lotion before the child is put to the breast again. In some cases the nipple is so painful, and the irritation caused by suckling so great, that it becomes necessary to remove the child permanently and bring it up by hand, or obtain the services of a wet nurse.

MILK ABSCESS.—This may occur in any case in which there is a fair quantity of milk secreted. It is said to occur more frequently in the weakly and delicate than in the strong and robust. The breast at first is full; a part of it remains hard and tender after the gland has been emptied. There is sharp, darting pain in it. There may be a sharp shiver, or rigor, but this may be absent. The pain in the breast increases, and it becomes very tender to the touch. The hardness and fulness continue, and the part becomes red. Inflammation proceeding, the swelling increases; there is a distinct tumour; the pain and tenderness are severe; the skin is hot, red, glazed, or shining. Instead of the sharp darting pain, there is a painful throbbing in the breast. The glands in the armpit become swollen and the arm stiff at the shoulder. There is pain when the arm is moved. Shivering may occur again. When this happens, and the pain has assumed a throbbing character with the surface glazed, matter has formed—the inflammation has run on to abscess. As soon as it is certain that matter is present, it should be at once let out. This will save an immense amount of suffering, and in many cases effect a rapid recovery. On the other hand, if it is allowed to burst of itself, the suffering of the patient will continue for a long time, and until the discharge escapes is of a very severe character. The matter is often formed deeply in or under the gland, and in these cases it takes a long time to reach the surface and escape, and during the whole of this time the throbbing pain is severe.

Moreover, when it has escaped after this long delay, the process of recovery is much less rapid than when it is let out early. Sometimes several abscesses form in succession, and the breast becomes a mass of almost stony hardness. When abscess has occurred once, it is liable to occur again, though by judicious treatment it may in many cases be warded off.

TREATMENT.—The breasts should be periodically emptied. Frequently some parts of the glands remain hard and full, while the rest is soft and flaccid. When this happens, gentle friction with warm olive oil should be made over the full part. When inflammation has set in, cold lotions should be tried; when these fail, hot fomentations and poultices should be applied until matter is formed, which should be immediately allowed to escape. Poulticing for a few days, and the application of pressure, with liberal diet, will, in most cases effect a rapid cure.

CHAPTER XVI.

MANAGEMENT OF THE NEW-BORN INFANT.

Clothing—Food—Wet-nurse—Feeding-bottles—Sleep, Cleanliness, and Bathing—Light, Air, and Exercise—Diseases of Infancy.

WE consigned the new-born child to a warm flannel to be placed in a comfortable place, either on the bed or near the fire, according to the time of year, temperature of the room, etc. We must now return to it in order to prepare for its future, whatever that may be. The first duty to it is a thorough washing with soap and water. The child is usually covered by a whitish curdy or soapy material, all of which has to be removed in the first bath. Having washed and carefully dried it with a soft towel, the folds formed by the skin at the flexures of the joints, around the neck, under the armpits, inside the thighs and groins, should be powdered with a mixture of starch and oxide of zinc, in order to prevent irritation of the skin from rubbing of the parts against each other.

The next object that deserves attention is the navel-string. About two inches of this is left attached to the body of the child, and in the course of a few days, this, which undergoes a process of putrefaction, drops off at the navel. It is usually wrapped in a piece of cotton or linen which has been charred before the fire. A square piece of linen, about six or eight inches long, and four to six wide, is taken, and generally charred; then a hole is passed through its centre; the navel-cord is put through this hole and wrapped in the folded linen. This charred linen serves to preserve the decomposing part sweet and free from offensive odour, the charred surface being antiseptic in its action. The cord withers and falls off about the fourth or fifth day.

CLOTHING.—A certain temperature of the body is necessary to existence. Too great an elevation, as well as too great a depression of temperature, are incompatible with life. For the purpose of retaining heat generated in the body and withstanding the effects of cold, clothes are worn. The child before birth was maintained at an uniform temperature equal to that of the mother, through its peculiar connection with her; and when it is born and becomes exposed to external influences it is necessary to protect it from such as are productive of evil results. One of these is cold, and it is natural to expect that its effects on a new-born child might prove serious. This is indeed the case, and it becomes necessary not only to clothe the infant warmly

but often to expose it to artificial heat, either in bed with the mother or near the fire. The baby clothes are generally of flannel, and are made of such length that they reach beyond the feet and can be folded up over them. In this manner all draughts are prevented from affecting the lower limbs and body of the infant.

FOOD.—The milk, which is the new-born child's natural food, is not formed in the breast usually until the third day. During this time the infant requires but little nourishment: a little sugar and water, or a little milk with a good deal of water and a little sugar, will be quite sufficient. The child should be put to the breast early for reasons already given, and the infant's first food comes to be the milk formed in the breast. This is called colostrum, and possesses irritating properties, and acts as a laxative on the child's bowels. The bowels generally act spontaneously during the first and second day, and the motions passed have a peculiar dark green colour. The action of the first milk carries all this substance away, and the matter passed assumes the natural yellow colour. Should the bowels remain without acting until the milk has formed in the breast, there is no need for anxiety or alarm; nor should laxatives, in the form of castor oil or brown sugar, be given. They may do harm by irritating the stomach and bowels, and set up an obstinate diarrhœa. It is better to wait until the laxative prepared by Nature can be administered. If the mother be strong and has sufficient milk, the child should for the first seven months be fed with nothing else.

Circumstances may arise which render it impossible for the mother to nurse her infant. When this happens, one of two courses may be followed—a wet nurse may be obtained, or the child may be “brought up by hand.” Of these there can be no question which is the better. The food best suited for the infant is breast milk, and when possible it should be obtained. No wet nurse should be employed unless she has been seen and recommended by a doctor. The selection of one is a question of very great importance, for upon it will depend the health of the child. She should be between the ages of nineteen and twenty-eight; healthy, and from the country if possible; free from skin rashes or any disease which could be transmitted to the child. The breast should be well developed, secrete sufficient milk, and the nipple ought to be well formed and free from fissures and excoriations. Her child should be as nearly as possible of the age of the child which she is to nurse. If her child is strong, healthy, and well nourished, or if she has nursed previously in a satisfactory manner, it speaks greatly in her favour. Her diet should be carefully regulated. The belief that a woman cannot nurse unless she takes a certain quantity of stout or

ale daily is much too prevalent, and mothers anxious for the welfare of their children not uncommonly over-stimulate their nurses, and thus bring about evils they wish to avoid. As a rule, two glasses of ale or stout a day are ample, and unless the nurse has been accustomed to take malt liquor she should be allowed none. The diet should be plain and easily digestible: meat, bread, and vegetables, in the quantities she has been used to. Over-feeding and over-stimulation are sure to upset the stomach and alter the character of the milk, so that it irritates the infantile stomach, sets up diarrhœa and vomiting, which are frequently difficult of control. It may even upset the secretion of milk, and in some cases suppress it altogether.

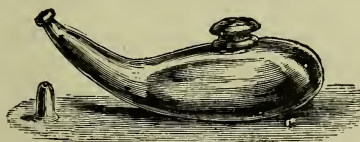
The second method—rearing the child by hand—should be avoided, if possible; but circumstances may arise in which it becomes inevitable. In these circumstances the object should be to obtain a substitute for mother's milk, which, at the same time, resembles it as nearly as possible in character. The milk of different animals varies much in composition, some containing an excess of water, others an excess of fat, or of casein or cheese-making material. The milk of the ass or goat resembles most that of the human mother, and forms, perhaps, the best substitute for it, and when possible one of them should be obtained. This is, however, frequently not possible, and then it is necessary to fall back on cow's milk. Cow's milk is much richer in solid matters, but poorer in sugar and fatty matter than mother's milk. It is, indeed, too rich for the young infant, and when given in its natural state is sure to upset the stomach, give rise to indigestion, acidity, vomiting, and diarrhœa. With a view to render cow's milk more like that of the mother, it is necessary to add water to dilute it, sugar to sweeten, and cream to supply the fatty material. One table-spoonful of good milk, two of water, one teaspoonful of cream, and a little white sugar, form the best mixture. It should, however, be stated that when the milk is of a poor quality, the quantity of water added should be less. No solid food should be given for the first six or seven months, and milk should in no case be thickened by means of corn-flour or meal of any kind, arrowroot, etc. Such substances the infant's stomach is unable to digest, and evil consequences will surely follow their administration.

Mothers and nurses are often anxious to obtain milk from one cow; this, in the majority of instances, in large towns, is impossible, and, moreover, it is not desirable. It is better to obtain milk from cows feeding in the country than from those kept in stalls in town. The milk of any one company in large towns is usually obtained from several farms situated in the same district. The milk of several cows is mixed together, and there is no evidence that this mixture proves in

any way noxious to the infant. But we would repeat that the milk should be obtained from cows fed in the country. When a child grows and thrives, and becomes strong and fat, it is often thought that it requires not only more food, but requires solid food, or the addition of flour or arrowroot, or one of the many "infants' foods" invented. This is the greatest error. The strongest proof that the child takes sufficient food is the fact that it thrives—the very fact on which the erroneous belief is based. In such a case, we would strongly urge, "Let well alone." As to the inventions called "infants' food," many of them are exceedingly injurious from a chemical point of view, and advocated by the pettiest theories—we can only say, avoid them. They should never be administered, except when advised by a medical man. From the first, a child should be taught to feed at regular intervals. A healthy infant should sleep when it is not being fed or bathed. At first, it should be fed every two hours during the day. It should be taught to sleep the greater part of the night. If it is fed the last thing at night, about eleven o'clock, it requires nothing afterwards until four or five in the morning. At that time it may have a little milk and water and be brought to the mother about seven or eight o'clock.

The same rule should be observed when it is brought up by hand.

FEEDING BOTTLES.—These are of the greatest service when properly used. They are made so as to allow the child to suck its food gradually, and thus to prevent its mouth being too rapidly filled, and to imitate as far as possible the natural method of feeding. They are



FEEDING BOTTLE.

made of various shapes. Some have long india-rubber tubes attached to them, through which the food is sucked. These are the worst form, for it is almost impossible to keep them sweet and clean. The best form is that represented in the above illustration. It can be obtained of any druggist. It has a teat of india-rubber; it ought to be made of natural black india-rubber, for the caoutchouc has an offensive taste and smell. This form is easily cleaned and preserved sweet. For this purpose it should be kept, when not in use, in cold water. In summer, when milk is more liable to turn sour, a very small pinch of carbonate of soda may be added to the water; but it should be thoroughly washed off before use. This bottle has the

further advantage, that the child cannot go to sleep with the teat in its mouth. Both mothers and nurses are too fond of giving the child the bottle to send it to sleep; it is a practice fraught with the greatest evil. The milk is retained in the child's mouth, turns sour, and sets up dyspepsia, diarrhœa, and vomiting. Whenever the child has taken food its mouth should be wiped with a soft piece of linen moistened with water, so as to cleanse the gums and sides of the cheeks from the adhering milk.

We have stated that the infant should be fed at regular intervals. Nothing should be allowed to interfere with this rule. The cry of a child is generally regarded as a sign that it requires nourishment, or at least that then it should be offered some, but it is frequently not the case. Many things cause the child to cry besides the want of food, as an uneasy position, cold, noise, and, not least, over-feeding. More children cry from the pain and evil produced by over-feeding than from under-feeding, and when this is borne in mind it will be seen that the breast or the bottle is not the proper remedy for the trouble.

SLEEP.—We have said that a child should sleep during the intervals between feeding-times. As a rule, the more a child sleeps the better he thrives. Infants should not sleep with the mother or nurse, but in a cot. When it is absolutely necessary that an infant should sleep with its mother, it should never be allowed to do so with the nipple in its mouth: it is quite as bad as to have the teat of a bottle in it.

When a child is sleepless or restless, no sleeping-draughts or soothing-syrups should on any account be given. Indeed, no medicine of any kind, except a teaspoonful of castor-oil, perhaps, should be given to an infant without the advice of a doctor. Patent medicines going by the name of soothing syrup, or any other containing opium, are most dangerous in their effects, owing to the remarkably powerful influence exercised on the infant's constitution by soothing-syrups. Numerous deaths have resulted from their administration, besides incalculable injury to the health of many who have survived their poisonous effects.

If the rules just given with regard to feeding and sleep, and those about to be given on cleanliness, be accurately observed, children born healthy will thrive, and give but little trouble; on the other hand, if neglected, diseases are sure to follow—diseases which in many cases ultimately prove fatal.

CLEANLINESS.—Bathing is useful not only for cleanliness, but inducing sleep, allaying irritation, etc. A child should be bathed night and morning in warm water

Dr. Combe says:—

“On account of the great susceptibility of cold which exists in infancy, and the difficulty with which the system resists the influence of any sudden change, the temperature of the water ought, at first, to be nearly the same as that of the body, namely, about 96° or 98° Fahrenheit, and always to be regulated by a thermometer as the only test. If the nurse judge by the hand alone, she will often commit an error of several degrees, according to the varying state of her own health and sensations. The younger the infant, the more rigidly should this standard be adhered to; as it is not till after growth and strength have made some progress that it becomes safe to reduce the standard by a few degrees.

“In addition to the regular morning ablution, the tepid bath should be repeated every evening for a few minutes. Properly managed, and not too warm, it has the double advantage of soothing the nervous system, which is always irritable in infancy, and of sustaining an agreeable circulation of the blood towards the surface, and thus warding off internal disease. It ought not, however, to be too long continued, or used in a cold room, or immediately after nursing or feeding. With these precautions, the most unequivocal advantages often result from its use, especially in scrofulous and delicate children. For restless and irritable children, also, the bath is often of an immense advantage, from the quiet and refreshing sleep which it rarely fails to induce. As a sedative, too, it is of great value in subduing nervous excitement. But when used too warm, or continued too long, the bath is apt to excite undue perspiration, and to increase the liability to cold.

“We occasionally, though rarely, meet with children who, from mismanagement or some other cause, are frightened by immersion in warm water, and with whom the bath decidedly disagrees. In such instances, of course, it should be given up, and simple washing and sponging with tepid water be substituted. But in all circumstances, the greatest care must be taken never to allow an infant to be exposed to the air with a skin even partially wet, for imprudent exposure may be productive of some serious inflammatory affection. Many of the complaints made against the use of the bath arise entirely from improper management and the neglect of proper precautions.

“Some physicians and parents prefer the cold to the tepid bath, even from birth; but reason and experience concur in condemning it, and it is only when the infant is strongly constituted that it escapes from the use of the cold bath unhurt. After the lapse of a few months, however, the temperature of the water used for the morning ablution should be gradually reduced, provided the child continue healthy and the season of the year be warm. But to make any sudden change in winter, or when considerable delicacy exists, would be

attended with risk. I need scarcely add that when sufficient reaction and warmth do not speedily ensue after the use of cold bathing, it ought to be immediately given up, and the tepid bath substituted in its stead."

Cleanliness should be, moreover, observed in the frequent change of napkins. A child should not be allowed to lie any time in its own urine or motion. As soon as these are expelled they should be removed, the child thoroughly cleaned and dried, and then greased with olive oil or lard. This is a very good plan: better than powder; for it not only prevents excoriation, but also, to a certain degree, the direct contact of the excreta with the skin. It protects the skin from their irritating effects. When this has been done, a new and clean napkin should be applied. The napkins which have been wet with urine are sometimes merely dried before the fire, and used again without being washed. This is a practice to be utterly condemned. The napkin thus prepared is not clean; it is loaded with substances which irritate the skin, and give rise to sore bottom. Napkins once used should be thoroughly washed and dried before they are again applied to the child's body.

LIGHT, AIR, AND EXERCISE.—During the first months of infancy, all the exercise which the child can take is of a passive character. It should be carried about in the open air. Children are frequently tossed or even thrown into the air, and caught again as they descend. This is a form of exercise which gives the child great pleasure, as is evidenced by the signs of joy manifested by it; at the same time, it is not quite free from danger, for the child may slip out of the hands, or be missed in its descent. In such an event it would be liable to severe injury.

Light and air are necessary to the health of children as well as to that of animals and plants; and it should be a rule to take infants out once or twice daily when the weather is fine, even from a very early age. After the first month both summer and winter this should be done. At first the child cannot bear the light, and keeps his eyes always closed. His head and face should therefore be well protected by covering. When he begins to look about him, a veil should be substituted for the head and face cover.

DISEASES OF INFANCY.—The diseases which affect children during the first month are few. They chiefly regard the digestive organs, the stomach, and intestines. Diarrhœa is one of the commonest. It is due almost invariably to excess of or improper food. Children brought up on mothers' milk suffer little or not at all from this affection, while those brought up by hand invariably suffer at some period or other. The food given them is stronger than the stomach can digest. It is

not assimilated; it remains in the intestinal canal as a residue, and sets up irritation of the bowels. In these cases the child is always crying, draws up its legs as if in pain, suffers from colic, flatulence, passes wind, vomits its food—if it takes milk it returns curdled; it refuses food, wastes, may become convulsed, and die. The motions may be passed ten, twelve, or twenty times in the twenty-four hours; they are of a greenish colour, and smell very offensively. The child's bottom becomes red, sore, and inflamed. Thrush may set in and the diarrhœa become still worse.

The treatment of such diarrhœa should be the removal of the irritating matter from the bowels, and the administration of proper food. The first object is gained by a small dose (twenty or thirty drops) of castor oil. This the mother may venture to give to her infant; but on no account should any other drug be given, except by the doctor's orders. Having cleared the bowels, feed the child in the manner already described, and it will in all probability recover.

Constipation occasionally occurs in children. In such cases it is a mistake to administer laxatives. The best treatment consists in the introduction of a piece of soap into the bowels, to be left there until expelled. This is usually sufficient to excite the action of the torpid organ.

JAUNDICE.—Young children are subject, sometimes, to jaundice soon after birth. The skin and whites of the eyes become yellow; the stools may be pale or retain their natural colour. This condition generally passes off in a few days without treatment. If the bowels be confined, an occasional teaspoonful of castor oil will help the cure.

THRUSH.—Sometimes the mouths of children—the tongue, lips, and cheeks—become covered with numerous small white spots: this is thrush. It is due to imperfect nutrition, dependent on improper food.

TREATMENT.—Let the food be regulated and the mouth be washed out with a weak solution of borax—about twenty grains of borax to the ounce of water.

SORE BOTTOM.—A child should rarely or never suffer from this. If care be taken in changing the napkins as soon as they have become soiled with urine or motions, to dry the parts properly at each change, to observe absolute cleanliness, and to anoint the part with olive oil, zinc ointment, or to apply fuller's earth, a sore bottom becomes almost impossible. In certain cases, however, when the child has become reduced and weakened by bad feeding, prolonged diarrhœa, vomiting, and thrush, the bottom may become sore in spite of all precautions. In such cases the treatment must be directed to the more serious mischief, and the aid of the doctor called in.

CHAPTER XVII.

MONTHLY NURSING.

MUCH has been already said—under the heads Management of Labour, Lying-in, the milk and the infant—of what pertains to the duties of the monthly nurse. There are, however, still a few points which come especially under this head.

Nurses are now trained for special branches as well as for general nursing. The time is gone when a woman who is unfit for any other occupation can turn nurse; and though an occasional “Sairey” may still be seen, yet the days of that genus are passed. Good monthly nurses are now trained in our lying-in hospitals, and there is, as a rule, no difficulty in obtaining one from these charities or from one of the nursing institutions.

A nurse should not be so young as to be giddy, nor so old as to be useless. She should be cleanly, sober, truthful, and, above all, have a well-governed tongue. The want of the latter quality totally disqualifies a woman for nursing, whatever other qualifications she may possess.

Her dress should be plainly made, and of a material that can be washed. She should have a light step and a kindly disposition; a light sleeper, for she should wake at the faintest cry of the infant as well as at the call of the mother.

The monthly nurse, if possible, should be a person known to the new mother or her friends.

It is desirable that the nurse should be in the house two or three days before labour sets in; in these she has time to arrange the bed and the lying-in room, and get everything ready for the expected event.

The following articles should be in the lying-in room ready for use :—

Baby's clothes.
Basins and water, hot and cold.
Cold cream or lard, and olive oil.
Napkins.
Towels.
Safety-pins.
Binder.
Sponges.

Thread or Worsted for tying the navel-string.
A Flannel to receive the child.
Needles and thread.
Scissors.
Waterproof sheeting.
Powder-box.
A Higginson enema syringe.

When labour is about to begin, if the bowels have not already been freely moved, the nurse should give a clyster of soap and water. This will save future trouble and inconvenience.

Before, or as soon as labour sets in, the bed ought to be made ready. This is done in the following manner:—Uncover the mattress, and over the lower half of it spread a sheet of mackintosh, and upon this again a sheet folded double; upon this the ordinary clean sheet upon which the patient is to lie after the labour is ended. Upon this sheet another piece of mackintosh should be spread, then a folded blanket, and lastly, a folded sheet. These should cover the lower half of the bed so as to reach up to the patient's waist.

When the labour is over, the upper piece of mackintosh, blanket, and sheet, are to be withdrawn, and a dry clean bed is left for the new mother to lie upon.

A patient should walk about during the process of labour, for the force of gravity favours the progress of the child. When she goes to bed, she should be dressed in such a manner as to give rise to as little trouble as possible in the readjustment which is necessary when the process is ended. This is done as follows:—A clean chemise and night-dress are put on just before going to bed; they should be rolled up under the armpits; and the soiled dresses should be taken off and fastened round the waist, so as to form a covering for the body, and be removed without any serious trouble when the labour is over.

Thread or worsted for tying the cord should consist of several lengths of coarse white thread or worsted; or a piece of narrow tape answers the purpose equally well.

The binder should be made of stout calico, folded, about two yards in length, and about a foot or fourteen inches in width.

Having seen that all the articles required are ready at hand, and labour having set in, new duties devolve upon the nurse. She should see that the bowels and bladder are thoroughly emptied at the commencement of labour, and the latter organ from time to time afterwards. Women complain of cramp in the limbs at some stage of the process; in such cases the nurse should gently rub the part in order to afford relief.

Small quantities of food may be given to, but not forced upon, the patient during labour; it should be fluid: beef tea, milk, and tea. Cold water may be given in small quantities, but big draughts of it should not be allowed. Solid food is not necessary; and stimulants should not be given at all, unless expressly ordered by the medical attendant.

Vomiting is of frequent occurrence during labour. It has no serious import; on the contrary, it is often considered to be a favourable sign, for it is said that a sick labour is a safe one.

When the pains assume a forcing character and go to the back, the waters having come away, the medical attendant should be hastily summoned. As the pains in the back increase in severity, gentle pressure to support that part gives relief, and the lying-in patient generally expects it and calls for it. As the child is about coming into the world, the nurse is often requested to support the patient's knees, so as to separate the limbs, and relieve the patient of the effort required in maintaining it in an elevated position.

Should any unfavourable symptoms appear during the course of labour or of the lying-in month, the nurse should at once send for the doctor and communicate the fact to him. Convulsions occasionally occur, and they are of grave import. At other times the patient may faint. In this case it is probably due to loss of blood, and the nurse should immediately examine to see if such is the case. She should press on the uterus, in the manner described at page 259, until the doctor comes. Nurses, under circumstances of this kind, are fond of foretelling the course that events will take; it is a very foolish practice, for it is not possible for them to form an accurate opinion, and consequently they are as often wrong as right; the only result of such imprudence is to give trouble to the family and attendant.

A nurse should keep a careful watch over her patient during the lying-in month. She should see the breasts, and find out if the secretion of milk is abundant and sufficient for the child; she should carefully examine the discharges, observe the quantity and quality, and report to the medical attendant upon them. If they be deficient or offensive in character, if the patient complains of severe or lasting pain in the abdomen, the breasts, or the limbs, should she become feverish or have a shiver, the doctor should at once be made aware of it; for some of the diseases to which women are subject at this period yield rapidly when attacked early, but run a prolonged course when once they have taken firm hold of the patient.

For further treatment of the lying-in period and of the infant see the last two chapters.

CHAPTER XVIII.

THE CHANGE OF LIFE.

What it is—When it Occurs—Mode of Cessation of Periods—Effect of Changes on Body—
First Signs of Change—Symptoms—Bodily—Mental—Treatment—Final Results.

BY the term “change of life” is understood that period of a woman’s life at which her monthly courses cease to appear. This particular period is also known under a number of other names, such as the menopause, the critical time, and the climacteric; while the interval of time before their complete cessation, during which the menses often appear with great irregularity, is commonly termed by women the “dodging-time.” The menopause, marking as it does the close of the reproductive function, as puberty marks the onset, is an epoch of the greatest importance in the life of a woman. It is true that of late years there has been a re-action from the view that many of the serious diseases to which women are liable are most prone to make their first appearance at this time of life; but, as we shall see, marked mental as well as bodily troubles may be the accompaniment of this period. It has been shown, however, that the death-rate of women is not raised between forty and fifty years of age; and while the symptoms of the “change” are often very distressing, they are not, as a rule, such as to endanger life.

AGE AT WHICH IT OCCURS.—In the majority of cases the menopause occurs between forty-five and fifty years of age, the average being about forty-six. It has occurred as early as twenty-three, but this is quite exceptional; on the other hand, the periods may continue for a number of years beyond the usual time. According to Pliny, Cornelia gave birth to Valerius Saturninus at the age of seventy-one, and there is an authentic account of a woman in whom the poorly periods continued until the age of eighty-eight. The cases, however, where they are said to have continued until the age of one hundred or longer are no doubt fabulous.

In England the period of reproductive activity, from puberty to the menopause, extends over thirty to thirty-two years; the duration is longer in cold and shorter in warm climates. If the poorly periods appear first at an early age, they often continue until a late age, and

the fact of a woman having had a large family tends to postpone the occurrence of the "change of life." In women who suffer from fibroid tumours of the womb, the change is often late in appearing.

MODE OF CESSATION.—The menstrual periods do not as a rule cease suddenly. More commonly they first occur irregularly, the interval between them becoming gradually longer and longer; at the same time the amount lost at each period diminishes, until, after the occurrence a few times of what is little more than a show of blood, they finally cease altogether. Such irregularities may continue only for a few months, or may last two, three, or more years. It sometimes happens that the change is associated with excessive losses of blood at the periods—the last convulsions of a dying function; but this is one of the unusual symptoms that may occur rather than a normal condition of things. At the same time that the periods become irregular and less in amount, the character of the blood lost alters. At one time it is very light-coloured, almost colourless; at another time it is thick and black, like treacle.

Heredity may play a part in determining the character of the symptoms seen at the change of life, and the troubles that assailed the mother may be reproduced in the daughter.

In some women the change of life is not marked by any untoward symptoms; it lasts but a short time, and they quickly pass into a condition of perfect health, which continues without interruption for the rest of their life. With others, however, this is far from being the case. The critical period well deserves its name, and they suffer from a variety of troubles, some exceedingly serious, others only trivial, but all very trying.

EFFECT UPON THE BODY.—The tissues of a woman are very likely at this time to be ill-nourished. There is a tendency to the deposit of fat at the expense of the muscles, and, as a consequence, many of the organs of the body, especially those chiefly composed of muscular tissue, such as the heart, tend to suffer in their functions. The deposit of fat is at first especially marked in the walls of the abdomen, and it is due to this that so many women, when they experience the change, think they may possibly be pregnant. The increase in size of the stomach, due to the increasing stoutness, the cessation of the poorly periods, and the fluttering sensations often experienced as the result of flatulence—all lend colour to this view. It is, of course, quite possible for a woman to become pregnant at the period of the change, and it does occur from time to time; but erroneous suspicions of pregnancy are very common at this time of life, and are usually due

to the conditions mentioned. Besides, we must remember, as De la Motte says, many women have such a dislike to age that they would rather persuade themselves they are with child than suppose they are feeling the consequences of growing old. Should a woman become pregnant at this age, she will often find that, after her confinement, the change occurs quickly and with very little discomfort, for as a rule such women suffer less than those who have not had a child for some years. The cessation of the monthly periods does not always coincide with the termination of the reproductive period; thus cases have been met with where women have borne children some few years after the occurrence of the menopause. Such a case is related by Renaudin—of a woman who gave birth to a child at sixty-one years of age, the periods having ceased some ten years previously.

FIRST SIGN OF CHANGE.—The most important sign of the impending change is the commencing irregularity of the periods. Unless some such irregularity exists, any other symptoms that may be present cannot with certainty be ascribed to the menopause; this is a matter of great importance. It is unfortunately only too common for women to ascribe any condition occurring at this time to the change of life, and to allow such conditions to continue in the belief that when the change is complete they will cease of their own accord. That the symptoms are to be accounted for by the change is often shown by the following fact: When, as occasionally happens, a profuse flow occurs after some months of complete cessation, great and at times permanent relief is at once experienced from one or more of such symptoms. It is not uncommon for a woman, some little time before the change appears, to be in poor health, and it is especially important that any such impairment of health should be carefully attended to. The critical time is often one of considerable strain upon the bodily and mental resources, and by taking care of herself beforehand a woman will be able, when the change does come, to enter upon it under the best possible conditions.

A stormy, long-continued menopause must always be regarded with suspicion, and no time should be lost in obtaining medical advice when the symptoms are very marked or are in any way peculiar.

SYMPTOMS OF CHANGE OF LIFE.—The symptoms that are most commonly experienced at the "change of life" may be considered as bodily and mental. Under the former variety are seen flushings, numbness and coldness of the extremities, indigestion, constipation, palpitation of the heart, faintness, giddiness, and profuse perspirations associated with certain changes in the physical characters—namely,

increasing stoutness, diminution in size of the breasts, and often a tendency to a slight growth of hair on the face.

The mental changes are most commonly loss of memory, inability to fix the attention, hysterical manifestations, and at times marked despondency, tending to pass into a condition of intense melancholia.

The flushings of the climacteric are very characteristic, and often very distressing. They may occur in any part of the body, but are usually most marked in the face and neck. The face becomes suddenly greatly flushed, there is a feeling of excessive heat in the part, accompanied not uncommonly by an intense feeling of suffocation, and an irresistible desire to throw off clothes, and to open windows even in the coldest weather. At other times the flushes are accompanied by great coldness and numbness of the extremities; the feeling of heat will often cease abruptly at the elbow or knee, and the parts below will become quite cold and dead. Such flushings may occur many times during the day or only at long intervals; may last moments or hours; and may persist for a few months only, or for several years. The cessation of the flushings is frequently followed by very profuse perspirations; at other times the skin remains quite hot and dry, the so-called dry heats, often causing very great discomfort to women, since they torment them without the subsequent relief of perspiration. The attacks of flushing may supervene upon the least bodily or mental excitement, so that some women are constantly liable to their occurrence; and they are at times accompanied by great throbbing throughout the whole body, with marked mental depression. The malnutrition of the body, indicated by the undue deposit of fat, tells upon the functions of the stomach, and indigestion is a very common symptom at the menopause. The formation of gases resulting from the disordered state of the digestion leads to great distension and fulness of the abdomen, and there is often a feeling of great discomfort and tightness after meals. The increase in size of the abdomen, due to the flatulence, is one of the signs leading the woman to think she may be pregnant; but she will find that the size of her stomach markedly varies from time to time—a condition of things which would not exist were she in the family way; in the latter case, the stomach is hard and large, and does not vary in size. Marked constipation is often associated with the failure of the functions of the stomach, and calls for special treatment.

The existing indigestion, together with the flabbiness of the muscular tissue, tends to produce marked irregularity of the heart's action; palpitations frequently accompany the hot flushes, and there may be a most distressing sensation as if the heart had suddenly ceased beating, which leads to sudden awakening from sleep, with a fear of impending death.

Attacks of giddiness and faintness often occur, and very severe headache is one of the most trying of all the symptoms. The headache takes the form of weight and pain in the top of the head, or of pain shooting up the back of the neck. In some cases the pain appears to be limited to one brow, or to one side of the head, while in others the woman feels as if the head was opening or shutting, or as if a tight cap had been applied to the whole of the top of the head, and was causing the most unbearable sensation of pressure. At the same time there is usually great irritability of temper and depression of spirits.

The mental changes that may be present are exceedingly distressing, especially to the friends of the patient; they may occur only in a slight degree, or may form the most prominent feature of the change of life.

The mental depression is to be accounted for, perhaps, by the fact that many women experience a feeling that old age is approaching, its first sign is at hand, and they have a haunting sensation that for them at any rate the most important period of life is over. The feeling that old age has at last set one of its marks upon them, leads in some women to a feeling of futile anger and irritation, that markedly tends to increase the despondency and nervousness common to this period. The bodily symptoms, such as the flushings and the palpitations, although distressing to the patient, yet do not as a rule lead to any great interference with her social or family relations, but it is often far otherwise with the mental troubles. Women who are passing through the change of life, even if the mental disturbance is but slight, usually need all the kindly sympathy, forbearance, and patience of those around them. For the time being, they are often unreasonable and querulous, exceedingly suspicious, morbidly self-conscious, and complaining.

It happens at times that a woman has, besides the headache which is so common, a sudden feeling as if something had given way inside her skull, and from that time forwards there may be a very perceptible change in her disposition and mental state. In healthy middle life most people are quite unconscious of the fact that their various organs are performing their functions naturally. At the change of life a woman often becomes aware that she has a stomach, or a liver; and, from the increased nervous excitability present at the time, any slight defect in the working of these organs, which a few years previously might have gone entirely unnoticed, or at most would only have caused her a slight temporary inconvenience, is magnified and exaggerated, and gives rise to all kinds of unfounded suspicions as to the existence of organic disease. In most cases, however, where marked mental troubles are present, the suspicions relate rather to the actions of relatives and friends than to the idea of disease in any of the organs of the body.

They become extremely jealous of their husbands; they recall to mind various details of events that have occurred perhaps many years before; and, by magnifying trifles and perverting actions, they delude themselves with all kinds of foolish and impossible ideas. Brooding over fancied neglect upon the part of their husband or children, they become exceedingly despondent, and may ultimately pass into an extreme condition of melancholia. This state of mind may be accompanied by suicidal or even homicidal tendencies, and is one, therefore, calling for great care and the best advice. With certain surroundings a woman may become a prey to religious depression of a most marked kind.

It is not necessary in a book of this scope to enter into a discussion of all the mental troubles that may affect a woman at this time of life. It is sufficient to point out that it may be necessary, on account of the marked despondency, to separate the sufferer from her friends, and even to send her to an asylum. One cannot foretell whether a woman will pass through the "dodging-time" with or without her mental powers suffering. Women who become exceedingly stout are perhaps least liable to such afflictions; while if the change be suddenly induced, as the result of any sudden shock or emotion, the mental balance is very likely to be overthrown.

When we consider how grave the mental state in some women may become, it is very reassuring to find that the hope as to recovery is on the whole good. A large number of such cases get entirely well: with the complete cessation of the periods the mental disturbance passes off, and the patient recovers to enjoy often the best of health for the remainder of her life. A certain proportion, of course, do not make such a favourable recovery, but the outlook, on the whole, is distinctly good, and the unwearying patience and forbearance of the friends are in the end fully rewarded.

We have now briefly considered most of the symptoms that are likely to be present at the change of life; it must, however, be borne in mind that while, on the one hand, they may occur singly or in various combinations, on the other hand, they may be entirely absent. The two most commonly present are undoubtedly the flushings and indigestion. A frequent association is the following:—Great weight and heat are complained of on the top of the head, shooting pains up the back of the neck, with frequent flushings of the face, and hot and cold perspirations; such disorders being frequently associated with, and due to, flatulence and indigestion.

After the occurrence of the change, there should be a complete cessation of all bleeding and discharge from the vagina, and any return of either must be looked upon with great suspicion, especially if it be bleeding. At the menopause the womb and its appendages tend to

wither and atrophy, and their functions may be considered to have entirely ceased. A woman after this period should hardly know that she possesses such organs; they should never cause her the slightest trouble or discomfort, and if any bleeding or discharge occur, medical advice must at once be sought.

A few women are the better for the monthly occurrence of their periods, but many have much better health after than before the climacteric, more especially those who have been accustomed to lose rather abundantly at their poorly times.

TREATMENT.—In many cases no treatment is required at the change of life; the symptoms are so slight as to cause no inconvenience at all, and, as we have seen, many women pass through this time without any discomfort. In such cases nothing need be done. In others, the patient requires relief for the incessant flushings, headache, or indigestion that annoy her.

It is important to realise that there is no definite remedy for the menopause; the period must be passed through, and the woman must wait patiently for the time which is bound to come sooner or later, when, with the final cessation of the poorly periods, all her troubles will cease. Many of the symptoms stand midway between health and disease, and it is often difficult to say where one ends and the other begins. An amount of disturbance which one person will make light of, is attended in another by such distress as to call for immediate relief.

The general plan of treatment consists in getting the body into the best possible condition of health, and in treating any special symptoms that may arise.

If a woman wishes to look forward without anxiety as to the state of her health after the change, it is very necessary that she should not neglect herself at this period, for although one cannot positively affirm that a menopause free from disturbance is likely to be followed by good health, yet this is very frequently the case. It is of great importance at this time of life to see that the waste of the body is duly balanced by the repair, and for this reason the diet requires especial attention. The food should be light, but nourishing; many women during the change lead a very sedentary existence, and are apt to forget that without the necessary exercise they are no longer able to digest so much meat as in former years. Any indigestion that exists must be carefully treated by medicine and dieting. All highly spiced meats and foods are best avoided, as are also strong tea, coffee, wines, and liqueurs. One must utter a warning against the abuse of stimulants,

a habit likely to be first acquired at the change; a little stimulant is taken as a prophylactic against an attack of faintness or giddiness, or for the depression of spirits, and for the time being relief is obtained, but it is only temporary; and only too certainly an aggravation of the depression, and nervousness, will follow the abuse of stimulants. No doubt some women are all the better for one or two glasses of wine a day; but there are many others who do not require it. For those who are unable to take wine, a tumblerful or two of fresh milk is an excellent substitute, and is, in fact, more than a substitute, since it is often better than the wine itself.

Constipation must be avoided above all things; the bowels should be kept regular if possible by dieting, and for this purpose there is nothing so good as fruit for those who can take it, fresh in summer and autumn, and at other times of the year tinned or dried; the latter kinds may be stewed, and taken at lunch or dinner. If dieting fails, recourse must be had to drugs, such as small doses of Epsom salts, cascara, or one of the mineral waters, amongst the best for this purpose being those of Vichy, Carlsbad, Pullna, and Friedrichshall. The importance of a daily evacuation of the bowels is very great; an attack of piles, often a source of much suffering to women, is mainly attributable to neglect in this matter; and the accumulation of wind in the large gut tends to embarrass both the stomach and the heart, and is the usual cause of the attacks of palpitation, so distressing to the sufferer. Besides this, if the bowels be constipated, the functions of the liver are also likely to be deranged, and biliousness, so frequent a concomitant of constipation, will be added to the troubles already present. Scanty, high-coloured urine, with a brick-red deposit on standing, often accompanies such a condition of things, but need cause no anxiety; it is only a further indication that the liver and bowels are not discharging their functions normally.

Frequent baths are desirable at this time of life; they should be tepid, and not cold, and are especially called for on account of the profuse perspirations that so frequently follow the flushes of heat. Sea-bathing is not, as a rule, to be recommended; but the change to the seaside, undertaken, perhaps, for the health of the children, will often repay the mother, by causing a marked improvement in her own health.

The distressing attacks of palpitation may be remedied by attention to the digestion, and treatment is especially called for when they give rise to great nervous depression and sleeplessness. How dependent they are upon the condition of the stomach is shown by the speedy relief that follows the alleviation of the dyspepsia.

Poorness of the blood, or anæmia, is not an infrequent accompaniment of the menopause, and calls for treatment by tonics and iron. In some

cases great benefit will follow a visit to one of the chalybeate springs already mentioned in Chapter II.

In the place of anæmia there may be a condition of plethora, or too much blood. The body, being accustomed to lose a certain amount at each poorly period, continues to exhibit the same need after the occurrence of the menopause, and attacks of flushings and headache may occur at monthly intervals after the periods have ceased; they are often best treated by free purgation and the avoidance of a too generous diet.

With regard to the mental disturbance, frequently the only remedy available is general treatment. The physical health must be attended to, and one can only hope that as it improves the mental condition may also mend. Some kind of occupation that will engage the mind as well as the body is extremely useful; women who tend to be despondent and depressed should try to rouse themselves by taking an interest in the troubles of others. Attempts to alleviate the sickness and suffering often so prevalent around them will help to banish from their minds the remembrance of their own much smaller worries. Change of scene and climate may be greatly recommended; travelling, with its new interests and scenes, is very beneficial.

But to many such things are not possible, and they are dependent upon their friends for their amusements and interests. It is in such cases—where, from want of means or other reasons, the woman is compelled to stay at home—that her ultimate recovery depends so much upon her surroundings.

The value of a certain amount of exercise is too often overlooked: sleeplessness may be a marked symptom at the change; and while in some cases it is necessary to have recourse to drugs, yet if a woman will only make up her mind to take a certain amount of outdoor walking exercise every day, she is much more likely to sleep well than if she neglects such means and flies to drugs. The sleeplessness is at times peculiar in being present only in certain places; a change from the country to the town, or *vice versa*, in such cases may be sufficient to cure it.

“The menopause may be said to be a final settlement, for, provided no organic disease arises at this time, the rest of life is usually passed in uninterrupted health. This final change causes longevity to be attained more frequently by women than by men: but the invigoration of health is bought at some little sacrifice of feminine grace. When safely anchored in this sure haven, a woman looks back on the time when her health was likely to be disturbed by ever-recurring infirmities, by pregnancy with its eccentricities, by the perils of childbirth, and

the annoyances of nursing. From the tranquillity she has attained to, she may well look back to the long years when love, jealousy, and their attendant emotions often harrowed up her soul, and everything was presented to her mind through the delusive prisms of passion. She will find how much her existence is changed from what it was, and will understand the saying of Madame de Deffand, '*Autrefois, quand j'étais femme.*'"

GLOSSARY OF TERMS.

A.

Amenorrhœa, absent or scanty menstruation.

Anteflexion, a bending forward of the womb.

Anteversion, falling forward of the womb.

Areola, the dark area around the nipples.

Areola, Secondary, a ring of fainter tint around the areola, and appearing during pregnancy.

Asexual, without sex.

Auscultation, the act of listening to the heart sounds or breath sounds in the chest.

B.

Ballottement, a test for pregnancy.

C.

Cancerum oris, a gangrenous form of inflammation that attacks the face of children; also called *Noma*.

Catamenia, menstruation.

Chlorosis, a watery condition of the blood, which is impaired also in quantity.

Climacteric, the period at which the menses cease; known also as the *Change of Life*.

Clyster, a term for an enema.

Colostrum, the secretion from the breast during the first few days after delivery.

Cystocele, a condition confused with fallen womb, and caused by the falling of the anterior wall of the vagina. (See *Rectocele*.)

D.

Dysmenorrhœa, menstruation accompanied by pain. (See *Membranous* and *Ovarian*.)

E.

Endometritis, inflammation of the lining membrane of the womb.

Enema, an injection into the rectum.

F.

Fallopian tubes lead from the womb to the cavity of the belly.

Fibroid tumours, growths of the womb.

Funic souffle, sound sometimes heard during pregnancy.

H.

Hæmatocele, bleeding round the womb.

Hæmorrhage, bleeding. (See *Pudendal*.)

Hæmorrhoids, piles.

Hymen, a membranous fold drawn across the mouth of the vagina, but not completely closing that opening.

I.

Involution, process whereby womb is reduced in size after delivery.

L.

Leucorrhœa, the "whites."

M.

Membranous dysmenorrhœa, menstruation accompanied by pain and the expulsion of a membrane.

Menopause, time of life when monthly flow ceases to appear.

Menorrhagia, deranged or excessive menstrual flow, or hæmorrhage accompanying the monthly flow.

Metrorrhagia, hæmorrhage occurring in the intervals between monthly flows.

Micturition, the act of passing urine.

Molimina, premonitory symptoms of menstruation.

N.

Noma, a gangrenous form of inflammation that attacks the face of children; also called *Cancrum oris*.

O.

Ovarian dysmenorrhœa, menstruation accompanied by pain, due to inflammation and other diseases of the ovary.

Ovaries, the organs, of which there is one on each side of the womb, producing the germs that develop into the child.

P.

Placenta, the after-birth.

Plethora, full-bloodedness.

Polypus, a stalked tumour growing from the inner surface of the uterus.

Prolapsus, falling of the womb.

Pruritus, itching of the vulva.

Puberty, the period of transition from girlhood to womanhood.

Pudendal Hæmorrhage, bleeding into or from the vulva.

R.

Rectocele, a condition caused by the falling of the posterior wall of the vagina and anterior wall of rectum. It is frequently mistaken for the falling of the womb. (See *Cystocele*.)

Rectum, the lower extremity of the bowel.

Repercussion, a method of testing for pregnancy.

Retroflexion, a bending backwards of the womb.

Retroversion, a falling backwards of the womb.

S.

Subinvolution, that state of the womb when its reduction in size after delivery is impeded.

U.

Umbilicus, the navel.

Urethra, passage leading from the bladder, along which urine is passed.

V.

Vaginitis, inflammation of the vagina.

Vulvitis, inflammation of the vulva.

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